• Blood pressure profile for children aged 5 to 6 years and its associated factors – a cross-sectional study in Kuching district, Sarawak

• Knowledge, utilization and barriers to primary care services for sexual and reproductive health among adolescents in secondary schools in Selangor, Malaysia

• Nurses’ knowledge, beliefs and practices regarding the screening and treatment of postpartum depression in maternal and child health clinics: A cross-sectional survey
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   3. Relevant to family practice
iii. Invited debate/commentary/discussion/letters/online/comment/editorial on topics relevant to primary care.
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   1.1. Introduction
   1.2. Original article
   1.3. Case report
   1.4. Evidence-based commentary
   1.5. Review (CME) article

2. The full names, professional qualifications (limited to two only) and institutions of all authors. In addition, a shortened name of author(s) should be written in the style of surname or preferred name followed by initials, e.g. Atriya AS, Rajakumar MK, Hee WJ for future indexing.

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4. A declaration of conflicts of interest by all authors.

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Dear readers,

Recently, adolescents have been creating impact throughout the world. An example is Greta Thunberg who started the strikes against climate change.¹ Just 16 years old, she led a social movement to protest against what she saw as adult complacency to critical environmental changes. Greta is part of Generation Z, those born between the mid 1990s to early 2000s.¹ Born with the Internet revolution, this generation is both technologically- and social media-savvy.

This issue of the Malaysian Family Physician has 4 original articles and 6 case reports. Of these, two of the primary research articles are on adolescent health.²,³ These studies showed that there were barriers towards adolescent utilization and management in sexual and reproductive health in primary care. This is utterly depressing. If we are not reaching the young in Malaysia, they will seek for information and help from elsewhere. They will obtain information from the Internet, and this is often misleading and incorrect.

We need to do better in this. We need to succeed in finding ways to reach the young and ensure that they receive accurate information and help. We need to change attitudes and behavior of health care workers to be more supportive and caring. We need to change the health care system to be more open and accepting. We need to emulate adolescent leaders like Greta Thunberg and fight against complacency.

References


Blood pressure profile for children aged 5 to 6 years and its associated factors – a cross-sectional study in Kuching district, Sarawak

Cheah WL, Edmund Shin CV, Ayu Akida AR

Abstract

Introduction: This study aimed to determine the blood pressure profile for preschool children in Kuching Sarawak and its relationship with sociodemographic characteristics, nutritional status and parental hypertension.

Methods: This was a cross sectional study conducted in a government preschool in Kuching district from January to June 2017. Data were collected using questionnaire as well as anthropometric and blood pressure measurements. Data were entered into and analyzed using SPSS Version 22.

Results: A total of 229 preschool children participated in this study (response rate of 81%). About 9.7% of the respondents were at risk for hypertension. The mean systolic blood pressure was 95.6 mmHg (SD=8.36), and the mean diastolic blood pressure was 59.9 mmHg (SD=6.09). Ten percent of the children were overweight and 7.4% were obese. Binary logistics regression analysis indicated that gender (Male: OR = 3.085, p< 0.05), parent’s education level (comparing primary education and below with secondary education: OR = 4.88, p<0.05; comparing primary education and below tertiary education: OR = 7.63, p<0.05) and ethnicity (comparing Malay with Chinese: OR = 0.10, p< 0.01) were significantly associated with being at risk for hypertension.

Conclusion: The study showed that 9.7% of the children were at risk for hypertension and that 17.4% had abnormal body weights. Identifying and tackling the factors leading to these issues will help to improve and ensure a better quality of non-communicable disease programs offered in primary health clinics and school health programs.

Introduction

Hypertension is a major global public health issue and is the leading preventable cause of premature death worldwide, affecting developed, developing and under-developed countries. It is a health condition in which the blood vessels have persistently raised pressure. In 2008, the worldwide prevalence of hypertension in adults aged 25 years and above was reported to be 40%. In Malaysia, the overall prevalence of hypertension among adults 18 years of age and older was 30.3%. In 2010, hypertension was ranked as the leading single risk factor for the Global Burden of Disease. Cardiovascular disease accounts for approximately 17 million deaths a year worldwide. At least 45% of these deaths were due to ischemic heart disease, while 51% were due to stroke. Similarly, hypertensive-related diseases are still the leading cause of death in Malaysia, with ischemic heart disease and stroke accounting for 20.1% and 10.6% of the deaths respectively.

In primary hypertension, there is a complex interplay between genetic, environmental and lifestyle factors. Although certain molecular genetics are linked with primary hypertension, the environmental factor and lifestyle disparities are still central to the development of primary hypertension. Hence, the prevalence of primary hypertension is easily diagnosed. With the increasing prevalence of childhood obesity, hypertension is progressively diagnosed in children.

Hansen et al. in their cohort study of 14187 children and adolescents in US found that 3.6 % of children aged 3 to 18 years old were hypertensive. Manyike et al. showed that the prevalence of hypertension is about 3% among children aged 3 to 5 years in Nigeria. Data on childhood hypertension in the local setting has highlighted that the prevalence of hypertension in primary schools is high. According to Chong et al., 14% of children aged 7 and 8 years old from Sabah were found to be hypertensive. This finding is consistent with a study done by Sreeramareddy et al. among primary school children in Selangor, in which the prevalence...
rates for pre-hypertension and hypertension were 12.23% and 13.4%, respectively. These findings indicate that the prevalence of childhood hypertension in the local setting is unexpectedly high. Without timely interventions, hypertension will cause great economic and social impacts nationwide.

If hypertension in children goes undiagnosed or is left untreated, it may lead to premature death, disability, personal and family disruptions, loss of income, and increased healthcare expenditures, all of which take a toll on families and communities. Although the diagnosis of hypertension in children can be challenging, as it requires more time to calm children down to obtain accurate blood pressure readings, regular check-ups will be beneficial in detecting hypertension in children. On the other hand, in view of the high prevalence of childhood hypertension locally, research on the blood pressure profile for preschool children is crucial. It will not only provide baseline data on the blood pressure profile but will also provide information on the prevalence of hypertension in this younger age group. With these findings, children who are at risk for hypertension can be referred for further investigation and treatment to prevent complications. Lifestyle modifications, such as weight control, maintaining an active lifestyle and changes in diet, can be recommended at the household and community level. At present, there are limited publications on the blood pressure profile for children aged five to six years, especially in the local setting.

Materials and Methods

This cross-sectional study was conducted in Kuching District from January to June 2017. Kuching District is one of the three administrative districts under the Kuching Division and has a total area of 4,560 square kilometers. Based on the Malaysian Census 2016 reports, Kuching District has a population of 660,000, consisting of Malays, Chinese, Ibans, Bidayuhs, Melanaus, Indians and others.

There are 49 pre-schools in Kuching District managed by the Kuching Combined Education Office. Other preschools are managed via community development cooperation, privately and by non-governmental organizations. Applications were sent to the Ministry of Education Malaysia and Sarawak State Education to seek approval to conduct this study. Based on the list provided by Sarawak State Education, only 45 schools fulfilled the minimum requirement of 15 students per class. Detailed data on the classes and the total number of students from each school was obtained from the principal of each school prior to data collection. Each of the classes consisted of 15 to 50 children.

Only healthy children aged 5 to 6 years old who were mentally able and without known cardiac and kidney diseases were included in the study. The information on the health status of the children was obtained from their parents prior to the selection of the participants.

Sample size estimation was done using the formula: \( n = \frac{z^2 \cdot p \cdot (1-p)}{d^2} \)

Where \( n \) = sample size; \( z \) = critical standard normal value for a two-tailed test = 1.96 (95% confidence); \( p \) = anticipated population proportion with hypertension = 0.14; \( d \) = absolute precision required on either side of the proportion = 0.05%. Using these values plus a design effect of 1.5 and an anticipated non-response rate of 5%, a sample size of 280 children was needed to conduct the study. The result of the effect size test indicated a medium effect size with Cohen’s \( d = 0.60 \) and \( r = 0.30 \).

A multistage sampling technique was used. From the total of 45 preschools in the Kuching District, each school was placed into one of the three cluster based on its municipality. From each cluster, the children from two randomly selected preschools were assigned to the sample for a total sample size of 280 or greater.

A set of pre-tested questions available in the Malay language and English was used for the questionnaire. The questionnaire consisted of a socio-demographic profile (age, sex, ethnicity, parent’s marital status, parent’s education level, parent’s occupational status and total household income), past medical history and hypertension status for both parents.

Prior to the day of the children’s anthropometric and blood pressure measurements, their parents received a respondent information sheet together with an informed consent form and the questionnaire to fill out. If the parents consented to participate, one of them signed the consent form and filled in the questionnaire.

The children’s anthropometric data (weight and height) were obtained by the researchers and trained research assistants at their school.
For weight measurements, all children were instructed to wear minimal clothing, take off their shoes and stand still in the middle of a digital Omron Karada Scan weighing scale platform. Weights were read twice to the nearest 0.1 kg. Height was measured using a portable Seca body meter, with the children being told to be barefoot with their legs straight and to look straight ahead at the horizontal plane. Height measurements were taken twice to the nearest 0.1 cm. BMI was calculated based on the average readings and classified according to the BMI by age (z-score) where overweight > +1 SD and obese >+2 SD. The process of taking anthropometric measurement went smoothly with the help of the teachers. The children were used to these routine measurements being taken through the school health programme.

Blood pressure was measured using an Omron HEM-7120 automatic blood pressure monitor with a pediatric cuff (pediatric cuff size: 17-22cm). The instrument was calibrated during each visit with a mercury sphygmomanometer (MDF Instruments). Blood pressure measurements were taken in the classroom, with each child being asked to rest in their seat for at least 5 minutes. Measurements were taken on the right arm at the level of the child’s heart with the child’s feet resting on the floor. A second reading was taken 30 minutes after the first reading. An average of the two readings for both systolic and diastolic blood pressure were used for analysis and classification of the blood pressure based on the recommendations of the National High Blood Pressure Education Program Working Group on Blood Pressure in Children and Adolescents. According to the clinical guidelines, children with an average systolic blood pressure (SBP) and diastolic blood pressure (DBP) less than the 90th percentile for their height are classified as having normal blood pressure. An average SBP or DBP level greater than or equal to the 90th percentile for height, but less than the 95th percentile, is classified as “high normal/pre-hypertension” and considered to be an indication of higher risk of developing hypertension. To confirm hypertension in children, an average SBP or DBP that is greater than or equal to the 95th percentile for sex, age and height must be obtained on at least three separate occasions. For this study, as the measurement of blood pressure was done on one occasion, the term “at risk for hypertension” was used to classify an average SBP or DBP that is greater than or equal to the 90th percentile for sex, age and height. Children who were found to have hypertension at risk were referred to a doctor for further investigation and treatment.

The independent variables used in this study were age, gender, total household income, parental history of hypertension, body mass index, parents’ education level and ethnicity. The dependent variable was being at risk for hypertension. The collected data were coded and analyzed using the IBM Statistical Package for the Social Sciences (SPSS), Version 22. Descriptive and inferential analyses were performed based on a p value <0.05 indicating significance. To determine factors associated with being at risk for hypertension, multiple logistics regression was employed using the forward, backward and step-wise approaches.

Ethical approval for this study was obtained from the Ethical Committee of University Malaysia Sarawak, and written permission to conduct this study was obtained from the Malaysia Ministry of Education and Sarawak State Education Department. Verbal consent was given by the headmaster of each selected school, and written consent was obtained from the participants’ parents prior to data collection.

Results

A total of 229 children participated in the study, yielding a response rate of 81%. Participants’ socio-demographic characteristics, blood pressure readings and BMIs as well as parental histories of hypertension are presented in Tables 1 and 2. About 9.6% of the participants were found to be at risk for hypertension. Further, 10% of them were found to be overweight and 7.4% were obese.
Table 1. Sociodemographic characteristics of the participants (N=229)

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<th>Characteristics</th>
<th>n (%)</th>
<th>Mean ± SD</th>
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<td><strong>Age group (years old)</strong></td>
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<tr>
<td>5a</td>
<td>78 (34.1)</td>
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<tr>
<td>6b</td>
<td>151 (65.9)</td>
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<tr>
<td><strong>Gender</strong></td>
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<tr>
<td>Male</td>
<td>101 (44.1)</td>
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<tr>
<td>Female</td>
<td>128 (55.9)</td>
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<td><strong>Ethnicity</strong></td>
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<td>Malay</td>
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<td>Iban and other Bumiputera</td>
<td>54 (23.6)</td>
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<td>Bidayuh</td>
<td>52 (22.7)</td>
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<td>Chinese</td>
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<td><strong>Parents’ education level</strong></td>
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<td>Primary and below</td>
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<tr>
<td><strong>Household income (MYR)</strong></td>
<td></td>
<td>3303.9 ± 2510.84</td>
</tr>
<tr>
<td>Below 1500</td>
<td>63 (27.5)</td>
<td></td>
</tr>
<tr>
<td>1500-3500</td>
<td>87 (38.0)</td>
<td></td>
</tr>
<tr>
<td>Above 3500</td>
<td>79 (34.5)</td>
<td></td>
</tr>
</tbody>
</table>

*a* born from 2/1/2012; *b* born from 2/1/2011 to 1/1/2012

Table 2. Blood pressure, BMI and parental history of hypertension (N=229)

<table>
<thead>
<tr>
<th>BP categories</th>
<th>n (%)</th>
<th>Mean ± SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal BP (&lt;90th percentile)</td>
<td>207 (90.4)</td>
<td></td>
</tr>
<tr>
<td>Hypertension at risk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90th-95th percentile</td>
<td>17 (7.4)</td>
<td>5 (2.2)</td>
</tr>
<tr>
<td>&gt;95th percentile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Systolic Blood pressure (mm/Hg)</td>
<td>207 (90.4)</td>
<td>95.55 (8.36)</td>
</tr>
<tr>
<td>Diastolic blood pressure (mm/Hg)</td>
<td>128 (55.9)</td>
<td>59.98 (6.09)</td>
</tr>
<tr>
<td><strong>BMI (kg/m²)</strong></td>
<td></td>
<td>15.48 (2.28)</td>
</tr>
<tr>
<td>Normal</td>
<td>189 (82.5)</td>
<td></td>
</tr>
<tr>
<td>Overweight</td>
<td>23 (10.1)</td>
<td></td>
</tr>
<tr>
<td>Obese</td>
<td>17 (7.4)</td>
<td></td>
</tr>
<tr>
<td><strong>Family History of Hypertension</strong></td>
<td>16 (3.5)</td>
<td></td>
</tr>
</tbody>
</table>

*a* Self-reported

Logistic regression was undertaken to examine the impact of age, gender, total household income, parental history of hypertension, BMI, parent’s education level and ethnicity on being at risk for hypertension. Table 3 shows the final model of the analysis, consisting of gender, parent’s education level and ethnicity was statistically significant and provided good fit ($\chi^2(10,229)=30.346, p<0.001$). Further, it explained 11.9% (Cox and Snell R-square) of the variability in being at risk for hypertension.
Table 3. Binary logistics regression analysis for associated risk factors to hypertension at risk

<table>
<thead>
<tr>
<th></th>
<th>β</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Odds Ratio (OR)</th>
<th>95% C.I. for Odds Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (Ref=female)</td>
<td>1.127</td>
<td>0.532</td>
<td>4.49</td>
<td>1</td>
<td>0.034</td>
<td>3.09</td>
<td>1.09-8.75</td>
</tr>
<tr>
<td>Parents’ education level (Ref=primary and below)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Secondary</td>
<td>3.214</td>
<td>1.096</td>
<td>8.592</td>
<td>1</td>
<td>0.003</td>
<td>4.88</td>
<td>2.90-8.38</td>
</tr>
<tr>
<td>Tertiary</td>
<td>2.032</td>
<td>0.924</td>
<td>4.832</td>
<td>1</td>
<td>0.028</td>
<td>7.63</td>
<td>1.25-13.69</td>
</tr>
<tr>
<td>Ethnicity (Ref=Malay)</td>
<td>-0.233</td>
<td>0.845</td>
<td>7.624</td>
<td>1</td>
<td>0.006</td>
<td>0.10</td>
<td>0.02-0.51</td>
</tr>
<tr>
<td>Chinese</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>-3.766</td>
<td>1.307</td>
<td>8.298</td>
<td>1</td>
<td>0.004</td>
<td>0.02</td>
<td></td>
</tr>
</tbody>
</table>

Model chi-square: 30.346***, df=10
Hosmer and Lemeshow test: p-value>0.05

β = regression coefficient; S.E. = standard error; C.I. = confidence interval

Discussion

The mean systolic blood pressure for the 5-year-old participants in this study was 92.67 (SD=8.02) mmHg, and the mean diastolic blood pressure was 57.42 (SD=5.51) mmHg. These values are similar to those obtained in a study by Rosner et al.,13 in which the mean systolic and diastolic BPs for the 5-year-old participants were 93.4 mmHg and 56.6 mmHg, respectively. Sayeemuddin et al.14 found that the mean systolic and diastolic pressures were 99.69 (SD=3.62) mmHg and 60.11 (SD=3.64) mm/Hg, respectively, for 6-year-old participants, which matches up well with the values measured in our study (mean systolic blood pressure of 92.67, SD=8.02 mmHg and mean diastolic blood pressure of 57.42, SD=5.51 mmHg).

Overall, 2.2% of the participants had at least one blood pressure reading above the 95th percentile, which is relatively similar to the prevalence rates of hypertension among preschool children in Nigeria found by Manyike et al.8 and Odetunde et al.,15 which were 3% and 1.9%, respectively. Local studies on hypertension among primary school children in Malaysia showed a higher prevalence of hypertension than that of preschool children, ranging from 13.9-14.0%.8,10 The above-mentioned studies, with the exception of Manyike et al.,8 used the same reference value as the present study. Based on unpublished data on the hypertension prevalence among primary school children in Kuching Division carried out in 2017, 8.1% of the population was hypertensive. This far, there have been limited publications which have addressed the preschool children’s blood pressure profile, making comparisons of the prevalence of hypertension in preschool children difficult. In addition, the differences in the methodologies used in blood pressure measurements, such as the type of device used, the number of measurements taken and the setting in which the blood pressure was measured, all contribute to the variations found in the prevalence of hypertension. This study used the average of two blood pressure readings, which is consistent with the method used in Odetunde et al.,15 as well as the clinical guidelines for hypertension issued by the National High Blood Pressure Education Program Working Group on Blood Pressure in Children and Adolescents.12 Many other factors, such as variations among racial groups related to geographic, dietary and cultural practices, may potentially contribute to blood pressure profile differences.

In terms of BMI for the participants’ age group, this study showed that 10% of the participants were overweight and 7.4% of them were obese, in line with the prevalence rates discovered by Chong et al.9 (2.5%) and Sreeramareddy et al.10 (12.2%) among older children. The obesity rate was high, perhaps due to the rapid socio-economic development within the residential areas leading to sedentary behaviour and consumption of processed and nutrient-dense foods. However, the findings of this study, together with the available literature, indicate that the rate of childhood obesity in Malaysia is growing in a potentially important way.

Gender is well established as a factor that contributes to elevated blood pressure, particularly in older age groups.16,17 However, for younger age groups (aged 3-5), studies by Manyike et al.8 and Hamidu et al.18 showed...
that there were no gender differences in blood pressure. In this study, male participants were about three times more likely to be at risk for hypertension compared to the female participants. It is possible that this discrepancy could be rooted in obesity, as past studies involving children have associated hypertension with the prevalence of obesity.\textsuperscript{8,18} In the present study, univariate analysis showed that there was a significant difference between male and female participants in terms of being overweight and obese (21.8% vs 14.8%). However, such a difference was not seen in the multivariate analysis.

The present study demonstrates that higher levels of parental education are associated with higher odds of being at risk for hypertension. This finding is consistent with the higher number of overweight and obese parents with higher levels of education in this study, indicating the relationship between obesity and hypertension. However, this result contradicts the findings of Sarikhani et al.,\textsuperscript{19} who found that a lower prevalence of hypertension was associated with higher educational levels among adolescents in Iran. They further explained that parents with higher educational levels are associated with more positive health behaviors in terms of diet, i.e., using less processed food, salt, sugar and cooking oil, and healthier lifestyles, i.e., they encourage their children to be more physically active.

In a study by Rosner et al.,\textsuperscript{13} differences were found in the mean blood pressures of different ethnic groups. In particular, the prevalence of hypertension was higher among African American and Hispanic school-aged children compared to Caucasian children. Although evidence of the association between hypertension and ethnicity has been documented in most of the studies in this area to date, the exact pathophysiology of the association is still unknown. Therefore, the complex interactions between genes, lifestyles and environment should be explored further.

There was no association found between children and parental hypertension in this study, contrary to the longitudinal study by Li et al.\textsuperscript{20} Hansen et al.,\textsuperscript{7} who studied the aggregation of familial hypertension in children, concluded that familial hypertension in children will be manifested once the children are about 8 to 10 years old. This conclusion could explain the insignificant finding in our study. A study by Simoneti et al.\textsuperscript{21} also showed that a significant association exists between parental and childhood hypertension and explained the role of genetics in causing hypertension in childhood.

As this was a cross-sectional study, it could not determine the causation between the variables studied. Furthermore, the study participants were from preschools managed by the Ministry of Education only; therefore, the findings of this study cannot be generalized beyond this population. In addition, the under- or over-estimation of the prevalence of hypertension is common, as the results depend on the recruitment of the participants. Furthermore, the most accurate approach when determining a diagnosis of hypertension is based on at least three repeated measurements to confirm diagnosis, which is beyond the scope of this study. Nevertheless, the findings serve as a preliminary attempt to determine the prevalence of being at risk for hypertension and its associated factors.

Conclusions

The current study shows that 9.7% of children are at risk for hypertension and that 17.4% have abnormal body weights. Since these children are at cardiovascular risk, without timely interventions, they may be prematurely disabled. Health assessments through the school health program could include the measurement of blood pressure by trained school personnel. All cases of elevated blood pressure with or without any abnormal risk factor detected during screening should be reported to the parents and a referral to medical doctor for further investigation and management should be issued. Although the prevalence of being at risk for hypertension in this study was lower than the prevalence of childhood hypertension predicted by the WHO, this figure may continue to rise due to the increasing prevalence of obesity in our country. Since there have been limited publications on the preschool blood pressure profile, this study will help in providing data for new investigations and improving the understanding of the determinants of the blood pressure profile in children. Hence, it will be helpful in the development of public health strategies for prevention and treatment.

The results of this study can be utilized by public health practitioners to improve the quality of care provided to all children attending health care facilities and school
health programs. As childhood hypertension is under-diagnosed, greater efforts are needed to increase the awareness, and improve identification, of hypertension in children. Apart from health care professionals, parents should be encouraged to practice healthy lifestyles through improved diets and engaging their children in physical activity.

Competing Interest

This study did not receive any funding support. The authors declare that they have no competing interests.

How does this paper make a difference to general practice?

• This study provides data for the further understanding of the blood pressure profile in preschool children.
• The results of this study can be utilized by public health practitioners to improve the quality of care provided to all children attending health care facilities and school health programs.

Acknowledgement

The authors would like to thank the Ministry of Education of Malaysia and Sarawak State Education Department for the consent to carry out this project in a preschool setting and for providing kind assistance, information and data along the way in this research project.

References


Knowledge, utilization and barriers to primary care services for sexual and reproductive health among adolescents in secondary schools in Selangor, Malaysia

Othman S, Kong SZ, Mohd Mydin FH, Ng CJ


Keywords:
Adolescents, Sexual and Reproductive Health, Malaysia, Knowledge, Utilization, Barrier, Primary Care Services

Abstract

Early sexual debut, partner violence, pregnancy and sexually transmitted infections contribute to negative health outcomes among adolescents. While the primary care clinics offer accessible sexual and reproductive health (SRH) services to adolescents, it is uncertain whether adolescents are aware of and utilize these services. This study aimed to examine Malaysian adolescents’ knowledge, utilization and barriers to primary care services for SRH. A cross-sectional survey was conducted from August to November 2011 among adolescent from five randomly selected schools in Selangor, Malaysia. A self-administered questionnaire was used to assess their knowledge, attitudes, sexual behaviors and utilization of SRH services. A total of 680 adolescents participated in the study. One in ten of the adolescents were aware of the availability of SRH services, and only 6.9% of them had ever visited a primary care clinic for SRH. About 75% of them felt uncomfortable going to a primary care clinic for SRH services. Knowledge and utilization of primary care clinics for SRH among adolescents in Malaysia is poor.

Introduction

In Malaysia, primary care doctors are accessible to most of the population, including adolescents.1 The Ministry of Health (MOH), Malaysia developed the National Adolescent Health Policy in 2001 and the National Adolescent Health Plan of Action 2006-2020 in 2007.2 Health care services, including SRH services, were made available with widespread access to adolescents in all primary, secondary and tertiary health care facilities in Malaysia (United Nations, 2012).2 MOH has also been advocating for the provision of SRH services for adolescents, regardless of their marital status.2 Besides the health care facilities under MOH, another source of SRH health services for young people is the Kafe@teen Adolescent Centre run by National Population and Family Development Board under the auspices of the Ministry of Women, Family and Community Development.3 In addition, there is the Federation of Family Planning Associations of Malaysia, which is a nongovernmental organization that has branches nationwide and provides on-site as well as outreach reproductive health services.4 However, it is unclear if adolescents are aware of these services, especially as they pertain to SRH. Several studies in Malaysia have found that adolescents underutilize health service for other health matters.5,7 A cross-sectional study done in 2006 and 2011 among secondary schools students in Malaysia showed that 69.4% and 76% of them had dysmenorrhea, respectively.5,7 However, the percentage of secondary school students seeking medical consultations is still low despite showing an incremental from 11.1% in 2006 to 14.8% in 2011.5,7 Another cross-sectional study on 1092 adolescent females from 94 school in Kuala Lumpur found that 80.7% of these females experienced one or more affective symptoms and 83.6% experienced somatic symptoms in the pre-menstrual phase.6 Similarly, only 10.3% of these adolescent girls consulted their doctors.6 However, these figures could be due to symptoms not requiring a doctor’s consultation, self-care and using alternative treatments.

Utilization of health facilities is a direct outcome measure of health care interventions, and an increase in health service utilization has been associated with better health outcomes.5,9 Sexual activity is common among adolescents, and the sexual behaviors they engage in put them at risk for contracting sexually transmitted diseases as well as experiencing unwanted pregnancies, the complications of high-risk pregnancies and unsafe abortions.10-12 SRH
among adolescents and their demands for health services are related to the level of their awareness, and better knowledge of SRH improves adolescents’ acceptance and utilization of health services. Several other complex factors that influence the health service utilization of adolescents include their social-cultural influences, perceived needs, access to health services and provider barriers. In many instances, adolescents do not reveal their SRH problems and tend not to use the healthcare services they actually need. This behavior may be due to inadequate information, limited access to financial resources or negative attitudes of health workers. Studies have found that the most effective way to improve healthcare utilization is to remove provider barriers through improving timeliness, privacy, confidentiality, comprehensiveness and continuity of care. A qualitative exploration among adolescents undertaken in order to understanding their SRH needs showed that there are gaps in addressing SRH issues. Adolescents experience many SRH issues and lack of support. They have poor health-seeking behavior, and this exploration emphasized the need for adolescent-friendly healthcare services.

To date, there has been no study published in Malaysia that determines adolescents’ knowledge and utilization of primary care services for SRH. Therefore, this study aimed to determine this information. The secondary outcome of this study is an examination of the barriers to utilization of SRH services.

Methods

This cross-sectional study was carried out among Form Four students in secondary schools in a district in Selangor, Malaysia from August to November 2011. Five out of 70 available publicly-funded secondary schools were randomly selected. Using the Open Epi calculator, the calculation of the total sample size was made based on clustered random sampling with a confidence level of 95% and an estimated 80% prevalence of knowledge concerning SRH, which came from a pilot study of 66 Form Four students. The sample size was then doubled to allow a comparative analysis between male and female participants. An additional 20% was built in to take into consideration potential non-responders, giving rise to a total sample size of 600. The sample was then stratified according to the total number of students in each school.

This study utilized a questionnaire developed by the United Nation’s Population Fund (UNFPA) to assess knowledge of, attitudes concerning and utilization of SRH services. It consists of various domains, including knowledge and utilization of SRH services, factors involved in repeat usage of or refusal to use SRH services, personal experiences involving SRH services and sexual behaviors. The content of the questionnaire was validated by three family medicine specialists. The questionnaire also underwent forward and backward translation from English to the Bahasa Malaysia language with the help of qualified translators. The researchers who are fluent in both English and Bahasa Malaysia languages then reviewed the translated version. The questionnaires were pilot tested on 66 Form Four students at one of the schools for face validity and modified to suit local use. The data were analyzed using SPSS version 19.

Analysis was done on available data for each item. Statistical analyses were carried out using the Chi-square test for categorical data followed by the forward selection approach to binary logistic regression in order to identify independent predictors. In other words, nominal variables (p <0.1) identified by the Chi-square test were tested further using binary logistic regression analysis to look for significant associations between the independent variables and the dependent variable. The first dependent variable examined was knowledge of SRH services, defined as being aware of the availability of places or clinics to talk or find out about SRH-related topics in their communities. The independent variables in this case consisted of gender, head of household, health decision maker, religion, race, the ability to read, the ability to write, smoking, alcohol consumption, gambling and drug abuse. The other dependent variable examined was the utilization of SRH services, defined as visiting any health facilities or clinics for SRH services in the past year. The independent variables in this case consisted of gender, head of household, health decision maker, religion, race, ability to read, ability to write, smoking, alcohol consumption, gambling, drug abuse, knowledge of SRH services and sexual activity.

Ethics approval for this study was obtained from the University Malaya Research Ethics Committee (reference number 848.6). Permission was granted by the Ministry of
Education Malaysia (Educational Planning and Research Unit) and the State Education Department of Selangor to conduct the study at selected schools. At the school level, separate permission was obtained from each head teacher before the study was conducted. Parents went through the participant information sheet and provided written consent one week before data collection.

RESULTS

Sociodemographic characteristics

The response rate for this study was 79% (n=680/866). Reasons for not responding were failure to provide parental consent and not present during the data collection day. The participants’ socio-demographic characteristics are shown in Table 1.

Table 1. Sociodemographic characteristics at one month after motor vehicle accident

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age (n=678)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>93</td>
<td>13.7</td>
</tr>
<tr>
<td>16</td>
<td>515</td>
<td>76.0</td>
</tr>
<tr>
<td>17</td>
<td>69</td>
<td>10.1</td>
</tr>
<tr>
<td>18</td>
<td>1</td>
<td>0.2</td>
</tr>
<tr>
<td><strong>Gender (n=678)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>214</td>
<td>31.6</td>
</tr>
<tr>
<td>Female</td>
<td>464</td>
<td>68.4</td>
</tr>
<tr>
<td><strong>Ethnic group (n=678)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malay</td>
<td>323</td>
<td>47.6</td>
</tr>
<tr>
<td>Chinese</td>
<td>222</td>
<td>32.7</td>
</tr>
<tr>
<td>Indian</td>
<td>115</td>
<td>17.0</td>
</tr>
<tr>
<td>Other</td>
<td>18</td>
<td>2.7</td>
</tr>
<tr>
<td><strong>Religion (n=678)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muslim</td>
<td>334</td>
<td>49.2</td>
</tr>
<tr>
<td>Buddhist</td>
<td>172</td>
<td>25.4</td>
</tr>
<tr>
<td>Hindu</td>
<td>94</td>
<td>13.9</td>
</tr>
<tr>
<td>Christian</td>
<td>65</td>
<td>9.6</td>
</tr>
<tr>
<td>Others</td>
<td>13</td>
<td>1.9</td>
</tr>
<tr>
<td><strong>Head of household (n=671)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Myself</td>
<td>6</td>
<td>0.9</td>
</tr>
<tr>
<td>Father</td>
<td>579</td>
<td>86.3</td>
</tr>
<tr>
<td>Mother</td>
<td>62</td>
<td>9.2</td>
</tr>
<tr>
<td>Others</td>
<td>24</td>
<td>3.6</td>
</tr>
<tr>
<td><strong>Health decision maker (n=665)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Myself</td>
<td>100</td>
<td>15.0</td>
</tr>
<tr>
<td>Father</td>
<td>58</td>
<td>8.7</td>
</tr>
<tr>
<td>Mother</td>
<td>212</td>
<td>31.9</td>
</tr>
<tr>
<td>Both father and mother</td>
<td>282</td>
<td>42.4</td>
</tr>
<tr>
<td>Others</td>
<td>13</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>Ability to read (n=679)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No difficulties</td>
<td>585</td>
<td>86.2</td>
</tr>
<tr>
<td>Reading difficulties</td>
<td>94</td>
<td>13.8</td>
</tr>
<tr>
<td><strong>Ability to write</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No difficulties</td>
<td>589</td>
<td>87.6</td>
</tr>
<tr>
<td>Writing difficulties</td>
<td>83</td>
<td>12.4</td>
</tr>
</tbody>
</table>
Knowledge of SRH services

Only 10.8% (n=73) reported having knowledge concerning the availability of SRH services. There were significant associations between the knowledge of SRH service availability and the variables head of household (p=0.001), health decision maker (p=0.005), and religion (p=0.0021) (Table 2). Gender, race, the ability to read, the ability to write, smoking, drinking alcohol, gambling and sexual activity were not significantly related to knowledge of SRH services.

Table 2: Sociodemographic characteristics associated with the knowledge of SRH service availability

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Knowledge of SRH services</th>
<th>Chi-square value</th>
<th>P value*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes n (%)</td>
<td>No n (%)</td>
<td></td>
</tr>
<tr>
<td><strong>Head of household (n=678)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Father</td>
<td>56 (8.3)</td>
<td>521 (76.8)</td>
<td>13.097</td>
</tr>
<tr>
<td>Mother</td>
<td>6 (0.9)</td>
<td>56 (8.3)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>11 (1.6)</td>
<td>28</td>
<td></td>
</tr>
<tr>
<td><strong>Health decision maker (n=663)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adolescent</td>
<td>19 (2.9)</td>
<td>81 (12.2)</td>
<td>12.808</td>
</tr>
<tr>
<td>Father</td>
<td>1 (0.2)</td>
<td>56 (8.4)</td>
<td></td>
</tr>
<tr>
<td>Mother</td>
<td>21 (3.2)</td>
<td>190 (28.7)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>28 (4.2)</td>
<td>267 (40.2)</td>
<td></td>
</tr>
<tr>
<td><strong>Religion (n=678)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muslim</td>
<td>35 (5.2)</td>
<td>297 (43.8)</td>
<td>11.527</td>
</tr>
<tr>
<td>Christian</td>
<td>9 (1.3)</td>
<td>56 (8.3)</td>
<td></td>
</tr>
<tr>
<td>Buddhist</td>
<td>19 (2.8)</td>
<td>153 (22.6)</td>
<td></td>
</tr>
<tr>
<td>Hindu</td>
<td>5 (0.7)</td>
<td>89 (13.1)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>5 (0.7)</td>
<td>10 (1.5)</td>
<td></td>
</tr>
</tbody>
</table>

* Chi-square test
* P value< 0.05

However, only the health decision maker was significantly associated with knowledge after adjusting for confounders using logistic regression. Adolescents who make their own health decisions were more likely to be aware of the availability of SRH services compared to when the decision makers were their parents (OR: 2.00; 95% CI: 1.021 to 3.911; p=0.043) (Table 3).

Table 3: Association between knowledge of availability of SRH services and adolescent health decision maker established by binary logistic regression.

<table>
<thead>
<tr>
<th>Factor</th>
<th>B</th>
<th>SE</th>
<th>OR</th>
<th>95% CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health decision maker (n=663)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self</td>
<td>0.692</td>
<td>0.343</td>
<td>1.999</td>
<td>1.021-3.911</td>
<td>0.043*</td>
</tr>
<tr>
<td>Father</td>
<td>-1.725</td>
<td>1.032</td>
<td>0.178</td>
<td>0.024-1.346</td>
<td>0.095</td>
</tr>
<tr>
<td>Mother</td>
<td>0.068</td>
<td>0.317</td>
<td>1.070</td>
<td>0.575-1.992</td>
<td>0.830</td>
</tr>
<tr>
<td>Others</td>
<td>R</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

* P value< 0.05
R Reference category

Utilization of sexual and reproductive health services

Only 6.9% (n=40/583) of the adolescents had ever visited health facilities for SRH in the past year, and 6.5% (n=38/583) would like to have done so but thought that the service was not available. Gender, ability to read, ability to write, drinking alcohol, drug abuse, knowledge of SRH services and sexual activity were found to be associated with utilization of services (Table 4). Head of household, health decision maker, religion, race, smoking and gambling were not significantly associated with the utilization of SRH services.
Table 4: Associations between service utilization and sociodemographic characteristics, knowledge of SRH services and sexual activity

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Utilization of service</th>
<th>Chi-square</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Gender (n=583)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>19 (3.3)</td>
<td>161 (27.6)</td>
<td>5.562</td>
</tr>
<tr>
<td></td>
<td>21 (3.6)</td>
<td>382</td>
<td></td>
</tr>
<tr>
<td>Ability to read (n=583)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>29 (5.0)</td>
<td>482 (82.7)</td>
<td>9.106</td>
</tr>
<tr>
<td>No</td>
<td>11 (0.2)</td>
<td>61 (10.4)</td>
<td></td>
</tr>
<tr>
<td>Ability to write (n=583)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>31 (5.3)</td>
<td>485 (83.2)</td>
<td>5.116</td>
</tr>
<tr>
<td>No</td>
<td>9 (1.5)</td>
<td>58 (10.0)</td>
<td></td>
</tr>
<tr>
<td>Drinking alcohol drinking (n=546)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>9 (1.6)</td>
<td>60 (11.0)</td>
<td>4.514</td>
</tr>
<tr>
<td>No</td>
<td>29 (5.3)</td>
<td>448 (82.1)</td>
<td></td>
</tr>
<tr>
<td>Drug abuse (n=530)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>3 (0.6)</td>
<td>8 (1.5)</td>
<td>7.442</td>
</tr>
<tr>
<td>No</td>
<td>33 (6.2)</td>
<td>486 (91.7)</td>
<td></td>
</tr>
<tr>
<td>Aware of SRH services (n=582)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>16 (2.7)</td>
<td>46 (8.0)</td>
<td>38.866</td>
</tr>
<tr>
<td>No</td>
<td>24 (4.1)</td>
<td>496 (85.2)</td>
<td></td>
</tr>
<tr>
<td>Sexual activity (n=557)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>6 (10.8)</td>
<td>16 (2.9)</td>
<td>16.407</td>
</tr>
<tr>
<td>No</td>
<td>30 (5.4)</td>
<td>505 (90.7)</td>
<td></td>
</tr>
</tbody>
</table>

* Chi-square test
* P value< 0.05

Analysis using logistic regression found that adolescents with knowledge of SRH services was significantly more likely to utilize the services as compared to the others (OR: 7.83; 95% CI: 3.36 to 18.21; p<0.001) (Table 5).

Table 5: Association between service utilization and knowledge of SRH services using binary logistic regression.

<table>
<thead>
<tr>
<th>Factor</th>
<th>B</th>
<th>SE</th>
<th>OR</th>
<th>95% CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aware of SRH services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>2.057</td>
<td>0.431</td>
<td>7.825</td>
<td>3.362-18.211</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>No</td>
<td>R</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

R Reference category
* P value< 0.05

Discussion

A total of 639 responded to the question regarding barriers to visiting SRH facilities. Almost three-quarters (72.3 %; n=462/639) felt uncomfortable going to health facilities for issues related to SRH. In particular, 56.7% (n=262/462) felt ‘too embarrassed’ to do so, 37.7% (n=174/462) were worried about confidentiality, 13.6% (n=63/462) felt that the health staff was unfriendly, 9.1% (n=42/462) were concerned about high costs and 3.2% (n=15/462) has various other reasons for avoiding SRH facilities (Figure 1). It is a public health concern that most of the adolescents in this study did not have knowledge on the SRH services within their community. Although the findings were different from findings in the UK and US, similar low levels of SRH service knowledge have been reported in other Asian countries such as Thailand, Sri Lanka and Hong Kong. Adolescent knowledge of SRH services was strongly associated with the utilization of the services. Those who were aware of the availability of the SRH services...
Figure 1: Reasons given by participants for not feeling comfortable going to health facilities for sexual and reproductive health services

<table>
<thead>
<tr>
<th>Reason</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not confidential</td>
<td>174</td>
</tr>
<tr>
<td>Too embarrassed</td>
<td>262</td>
</tr>
<tr>
<td>Staff unfriendly</td>
<td>63</td>
</tr>
<tr>
<td>Costs too much</td>
<td>42</td>
</tr>
<tr>
<td>Other</td>
<td>19</td>
</tr>
</tbody>
</table>

were eight times more likely to utilize those services than those who were not aware of the availability. Lack of awareness among participating adolescents might be a reflection of their poor knowledge and reasons for the poor knowledge require further exploration. In addition, adolescents who make their own decisions regarding their health were two times more likely to be aware of the availability of SRH services compared to the rest of the adolescents in this study, suggesting that adolescents should be encouraged to take part in making decisions concerning their own health.

The World Health Organization’s conceptual framework model mentioned the need to increase adolescent awareness and build their knowledge of SRH services in order to increase utilization. Improving the rate of service utilization is associated with better SRH-related outcomes.

The percentage of adolescents who visited health services for SRH in this study was extremely low (6.9%), lower even than the findings of previous local studies, in which up to 15% of adolescents were seeking medical consultations for sexual and reproductive health problems. This difference could be due to the difference in baseline characteristic since the previous studies only included female participants.

This study also found that 6.5% of the participating adolescents reported wanting to visit health services for SRH, but that services or facilities were not available. The lack of access to SRH services may be one of the important barriers to service utilization among these adolescents. This finding was similar to that of a study done in Sri Lanka, which reported that the lack of availability of services was one of the important barriers to the utilization of health services for SRH.

Embarrassment and confidentiality were found to be important barriers to the utilization of primary care services for SRH. Studies in Sri Lanka and Hong Kong also found confidentiality to be a main barrier to the utilization of health services for SRH, but embarrassment was not considered to be a main barrier. However, a study done in Thailand found that stigmatization, inadequate confidentiality and negative attitudes on the part of health care providers were barriers to the utilization of health services for SRH. The observed differences between these studies (including the present study) could be related to cultural differences, especially since sex remains a sensitive topic in some communities. Previous studies in Canada and the US found that an adolescent’s perceived need for SRH services was an important reason for health service utilization. Our study, however, did not explore if a lack of perceived need could be a reason for poor service utilization in Malaysia. Therefore, further exploration of perceived needs for SRH services is needed.

About three-quarters of the adolescents in this study were not comfortable going to health facilities for SRH services, and the most common reason reported for this uncomfortable feeling was being embarrassed. More than half of the adolescents who have not visited health facilities for SRH
stated that they were embarrassed to go to the facilities, suggesting that sexually-related topics are still sensitive within our culture. This attitude might be rooted in the taboos surrounding the discussion of sex in Malaysian communities. In addition, negative news in the mass media linking sex to prostitution, abandoned infants, sexual violence, drug abuse, and various other psycho-social issues has been reported to affect the public’s perception of sex. Further exploration of the reasons for feeling embarrassed is needed and perceptions regarding sexually-related topics should be discussed properly with adolescents. Schools, the mass media, communities, guardians, and health care workers should play their appropriate roles when dealing with this issue. SRH should be addressed in such a way that it is part of regular, overall health, and problems in this area should not be stigmatized.

Lack of confidentiality was another important reason for adolescents to not feel comfortable visiting health facilities for SRH services in this study. About 38% of adolescents who have not visited health facilities for SRH stated that they worry about confidentiality. Adolescents should be informed that they are entitled to confidential services, and this information should be delivered as part of any SRH educational materials. In addition, health personnel should be informed that adolescents have the right to receive confidential services. Further, they should receive training concerning being more sensitive and not being judgmental. Confidentiality in consultations, the provision of gender-specific adolescent clinics, choice of staff by gender, and free services are all guaranteed at the facility level via government policies.

Unfriendly staff in health facilities and cost were two other significant barriers for adolescents in terms of accessing health facilities in this study. Efforts to tackle these two issues should be made, as either of these two factors could prevent an adolescent from accessing their SRH even if they wished to do so. Improvements could be made by observing and providing counseling to problematic staff. Training should emphasize non-judgmental attitudes, cultural issues and sensitivity towards adolescents’ problems. In terms of medical cost, adolescents attending school receive free treatment at public health facilities in Malaysia but not at private health facilities. Relevant policies should be formulated to ensure that cost is not a barrier to SRH services for adolescents.

A small percentage of adolescents in this study responded that they wanted to avail themselves of SRH services, but the services or health facilities were not available. This result might imply that either the SRH services were not provided by the health facilities available to the adolescents or that the SRH services were not widely known to the community. Therefore, more research on provider-level barriers needs to be conducted in a local context to look for potential barriers. Doing so is important, as adolescent SRH depends on service utilization, and service utilization depends on two important factors, i.e., supply and demand. Provider-level barriers affect the supply of services and thus limit overall utilization and outcomes.

Conclusion

Adolescents’ knowledge of the availability of primary care services for SRH and their utilization of such services were extremely low in this study. This result is most likely due to barriers related to the sensitive nature of SRH, healthcare providers’ attitudes and the availability of such services. This study highlights the importance of, and urgency in, empowering adolescents through SRH education and engaging healthcare professionals in providing SRH services that are sensitive to the needs of adolescents.

References


Nurses’ knowledge, beliefs and practices regarding the screening and treatment of postpartum depression in maternal and child health clinics: A cross-sectional survey

Kang PS, Mohazmi M, Ng YM, Liew SM

Keywords: Postpartum depression, knowledge, beliefs, practice, screening.

Introduction
Postpartum depression (PPD), which affects 10% to 15% of women worldwide, results in negative impacts, morbidity and even mortality for mothers, babies, and families. In the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM V), PPD is defined as a major depressive episode within 4 weeks after delivery. However, in clinical practice and research, the duration of depression is often extended to 12 months postpartum. In Malaysia, the prevalence ranges from 14.3% to 31.7%; this range of prevalence is likely to be due to the different inclusion criteria and screening tools used in different studies. Screening for PPD is strongly recommended by clinical guidelines. Numerous screening tools for PPD are available, such as the Edinburgh Postnatal Depression Scale (EPDS), the Postpartum Depression Screening Scale (PDSS), the Patient Health Questionnaire (PHQ-9), the Beck Depression Inventory (BDI) and the two-question screen test. However, PPD screening practices were poor, which was associated with their beliefs regarding time and responsibility.

Abstract
Background: Postpartum depression (PPD) affects 10-15% of women worldwide, and screening is recommended by clinical guidelines. In Malaysia, nurses in maternal and child health (MCH) clinics provide postpartum care.
Aim: To determine nurses’ level of knowledge, beliefs and practices regarding PPD and factors associated with screening practices.
Methods: A cross-sectional study using universal sampling was conducted on nurses from seven government MCH clinics in Malaysia. Data was collected from March until April 2016 through a self-reported questionnaire. Univariate and multivariate analyses were performed to identify factors associated with having ever performed PPD screening.
Results: Of the 108 nurses, 55.6% scored above the median total knowledge score (17 out of 24 points). Despite a high proportion of nurses believing that they were responsible for PPD screening (72.2%), counselling depressed mothers (72.2%) and referring mothers for further treatment (87.0%), only 64.8% and 51.9% were confident in recognizing PPD and counselling depressed mothers, respectively. Only 25.9% had ever practiced PPD screening, which was associated with beliefs concerning screening taking too much time (adjusted odds ratio [AOR]=0.13, 95% confidence interval [CI]= 0.02–0.74, P=0.022) and that screening is their responsibility (AOR=14.12, 95%CI=1.65-120.75, P=0.016).
Conclusion: More than half of the nurses scored above the median total knowledge score and had positive beliefs towards PPD screening. However, PPD screening practices were poor, and this outcome was associated with their beliefs regarding time and responsibility.
mild symptoms can be counselled by nurses, whereas those with moderate and severe symptoms should be referred to a doctor for further evaluation and treatment.

Studies among nurses in Malaysia have reported inadequate PPD knowledge, limited abilities in identifying mothers with PPD, no formal PPD assessment and barriers to PPD management, such as patients’ failures to disclose symptoms and preferences for complementary medicine to treat PPD. However, these studies did not assess nurses’ knowledge, beliefs, and practices quantitatively. Therefore, this study aimed to determine the nurses’ knowledge levels, beliefs and practices regarding PPD and also the factors associated with their screening practices.

Methods

A cross-sectional study was conducted from March until April 2016 in seven government MCH clinics in the Kepong district, which is an urban district in Kuala Lumpur, Malaysia. We obtained a list of nurses from the matron in charge of each clinic. Altogether, there were 133 MCH nurses in the Kepong district. All nurses who provide postpartum care were recruited using universal sampling. Nurses who were not available during the data collection period or who did not provide postpartum care were excluded. Participant information sheets and questionnaires were distributed to the nurses. Written consent was obtained from all participants.

In view of the small population size, the finite population correction method was used to determine the required sample size as follows:

\[ n' = \frac{N Z^2 \rho (1 - \rho)}{d^2 (N - 1) + Z^2 \rho (1 - \rho)} \]

\( n' \) = sample size with finite population correction, 
\( N \) = Population size, 
\( Z \) = \( z \)-statistic for a level of confidence, 
\( \rho \) = Expected proportion, and 
\( d \) = Precision.

Using the proportion of nurses practicing PPD screening from a study by Golbasi (16.2%), a 95% confidence level, a 5% margin of error and a population size of 133, the sample size required for this study is 82.

This study was approved by the Medical Ethics Committee of the University of Malaya Medical Centre and the Medical Research and Ethics Committee of the Ministry of Health, Malaysia. Permission was obtained from both the Kuala Lumpur and Putrajaya Health Departments and Kepong District Health Officers.

Questionnaire

A self-reported questionnaire was developed by the researcher based on a conceptual framework used by Leiferman et al. (Figure 1) and the questionnaires used in previous studies (with permission). It consisted of sociodemographic characteristics, 24 items on knowledge (general information, risk factors, symptoms, complications and treatments), 12 items on beliefs (socio-cultural beliefs, importance of screening, self-perceived responsibility and confidence level) and 11 items on practice (having ever performed PPD screening and screening tool awareness and utilization).

In the knowledge section, three response options were provided: “true”, “false” and “I do not know”. In the belief section, a 5-point Likert scale was used to rate the extent to which the participant agreed with each statement: “strongly disagree”, “disagree”, “neutral”, “agree” and “strongly agree”.

The questionnaire underwent face and content validation by an expert panel comprised of two primary care lecturers, one family medicine specialist, two psychiatrists and two obstetricians and gynaecologists. It was then forward- and backward-translated into the Malay language and pilot tested on 15 outpatient nurses who were not from the study population.
Statistical Analysis

Statistical analyses were performed using the SPSS version 23.0 for Windows (IBM Corp., Armonk, New York, USA). Continuous data which were normally distributed were expressed as means ± standard deviations (SDs), and continuous data which were not normally distributed were expressed as medians with interquartile ranges (IQRs). Categorical data were presented as the actual numbers and percentages.

In the knowledge section, 1 point was given for each correct response, and 0 points were given for each incorrect or “I do not know” response. The minimum score was 0, and the maximum total score was 24. By totaling the scores in each domain, the median total knowledge score was obtained. The results for each nurse were then expressed as above or below the median score.

The 5-point Likert scales were recategorized into 2 groups: “strongly agree” and “agree” were combined into the “agree” group, and the other responses were combined into the “did not agree” group to rate the extent of agreement with items in the belief section. Each statement was treated as an individual item.

The association between nurses’ sociodemographic characteristics and PPD knowledge with having ever practiced PPD screening was analyzed using simple logistic regression. Differences in belief variables between the screening and non-screening groups were analyzed using the Chi-square test or Fisher’s exact test when more than 20% of the expected values of the cells were below 5.

The variables with P-values of <0.25 from the univariate analyses were selected for multivariate logistic regression analysis to determine their association with having ever practiced PPD screening. A P-value of <0.05 was considered significant.

Results

Of the 133 nurses in this district, 15 did not provide postpartum care, 2 were on maternity leave, 6 were pursuing post-basic courses and 2 refused to give consent. Hence, there were 108 participants with a response rate of 98.2%.

All participants were female with a mean age of 35.04 ± 7.58 years. The majority were Malay (90.7%) and married (87%). There were 46 (42.6%) clinic nurses and 62 (57.4%) community nurses in this study. The median years in nursing and MCH were 10.00 (IQR=5.00–15.00) and 4.50 (IQR=2.12–9.00), respectively. Eighty-seven percent of the participants had received training on PPD. Family history of PPD was indicated by 3.7% of the participants, and none of the participants had a history of PPD (Table 1).

<table>
<thead>
<tr>
<th>Variables</th>
<th>n (%)</th>
<th>Mean ± SD/ Median (IQR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, years</td>
<td></td>
<td>35.04 ± 7.58</td>
</tr>
<tr>
<td>Female</td>
<td>108 (100)</td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malay</td>
<td>98 (90.7)</td>
<td></td>
</tr>
<tr>
<td>Indian</td>
<td>4 (3.7)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>6 (5.6)</td>
<td></td>
</tr>
<tr>
<td>Religion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muslim</td>
<td>100 (92.6)</td>
<td></td>
</tr>
<tr>
<td>Hindu</td>
<td>3 (2.8)</td>
<td></td>
</tr>
<tr>
<td>Christian</td>
<td>5 (4.6)</td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>94 (87.0)</td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>12 (11.1)</td>
<td></td>
</tr>
<tr>
<td>Divorced</td>
<td>1 (0.9)</td>
<td></td>
</tr>
<tr>
<td>Widowed</td>
<td>1 (0.9)</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Sociodemographic characteristics of participants (n=108).
### Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>n (%)</th>
<th>Mean ± SD/ Median (IQR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of children</td>
<td></td>
<td>2.00 (0 – 2.75)</td>
</tr>
<tr>
<td><strong>Position</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinic nurse</td>
<td>46 (42.6)</td>
<td></td>
</tr>
<tr>
<td>Community nurse</td>
<td>62 (57.4)</td>
<td></td>
</tr>
<tr>
<td>Number of years in nursing</td>
<td></td>
<td>10.00 (5.00 – 10.00)</td>
</tr>
<tr>
<td>Number of years in MCH</td>
<td></td>
<td>4.50 (2.12 – 9.00)</td>
</tr>
<tr>
<td><strong>Training in PPD</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>94 (87.0)</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>14 (13.0)</td>
<td></td>
</tr>
<tr>
<td>Family history of PPD</td>
<td>4 (3.7)</td>
<td></td>
</tr>
<tr>
<td>Self-experience of PPD</td>
<td>0 (0.0)</td>
<td></td>
</tr>
</tbody>
</table>

SD = Standard deviation; IQR = Interquartile range; MCH = Maternal and Child Health.

The median total knowledge score was 17 out of the maximum of 24 points, and 55.6% of the participants scored above this value. Participants did better in the risk factor, symptoms and complications of PPD domains, but poorer in the general information and treatment of PPD domains (Table 2).

### Table 2: PPD knowledge scores of the participants (n=108).

<table>
<thead>
<tr>
<th>Domains</th>
<th>Maximum score</th>
<th>Median (IQR)</th>
<th>Above median, n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>General information about PPD</td>
<td>5</td>
<td>2 (2 – 3)</td>
<td>50 (46.3)</td>
</tr>
<tr>
<td>Risk factors of PPD</td>
<td>5</td>
<td>4 (4 – 4)</td>
<td>88 (81.5)</td>
</tr>
<tr>
<td>Symptoms of PPD</td>
<td>6</td>
<td>5 (4 – 5)</td>
<td>77 (71.3)</td>
</tr>
<tr>
<td>Complications of PPD</td>
<td>4</td>
<td>4 (3 – 4)</td>
<td>69 (63.9)</td>
</tr>
<tr>
<td>Treatments for PPD</td>
<td>4</td>
<td>2 (1 – 2)</td>
<td>69 (63.9)</td>
</tr>
<tr>
<td>Total score</td>
<td>24</td>
<td>17 (16 – 18)</td>
<td>60 (55.6)</td>
</tr>
</tbody>
</table>

IQR = Interquartile range

Out of 108 participants, only a few correctly identified the following statements as true or false: “PPD only happens in the female, but not in the male” (5.6%), “taking methyldopa is a risk factor for PPD” (37.0%), “electroconvulsive therapy can be used in PPD” (25.9%) and “an antidepressant is contraindicated in breastfeeding mothers” (29.6%). Approximately 80% of them were not clear about the definition of the postpartum blues.

Table 3 displays the beliefs of participants towards PPD. Almost 80% agreed with “it is our culture that mothers do not discuss their depression with nurses” and “mothers with PPD prefer to seek alternative treatment for their depression”. Screening for PPD was believed to be necessary and most of them did not agree that screening takes too much time. A majority perceived of screening for PPD, counselling depressed mothers and referring depressed mothers for further assessment as part of their job responsibilities. However, only 64.8% and 51.9% of them were confident in recognizing PPD and counselling depressed mothers, respectively. Overall, the participants had positive beliefs towards their role in PPD treatment.
Table 3: Beliefs of the participants towards PPD (n=108).

<table>
<thead>
<tr>
<th>Items</th>
<th>Agree n (%)</th>
<th>Did not agree n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPD is a social stigma.</td>
<td>46 (42.6)</td>
<td>62 (57.4)</td>
</tr>
<tr>
<td>It is our culture that mothers do not discuss their depression with nurses.</td>
<td>85 (78.7)</td>
<td>23 (21.3)</td>
</tr>
<tr>
<td>Mothers with PPD prefer to seek alternative treatment for their depression.</td>
<td>86 (79.6)</td>
<td>22 (20.4)</td>
</tr>
<tr>
<td>Screening for PPD is necessary.</td>
<td>94 (87.0)</td>
<td>14 (13.0)</td>
</tr>
<tr>
<td>Screening for PPD takes too much time.</td>
<td>26 (24.1)</td>
<td>82 (75.9)</td>
</tr>
<tr>
<td>Screening for PPD is my responsibility.</td>
<td>78 (72.2)</td>
<td>30 (27.8)</td>
</tr>
<tr>
<td>Giving counselling to mothers with PPD is my responsibility.</td>
<td>78 (72.2)</td>
<td>30 (27.8)</td>
</tr>
<tr>
<td>Referring mothers with PPD for further treatment is my responsibility.</td>
<td>94 (87.0)</td>
<td>14 (13.0)</td>
</tr>
<tr>
<td>I am confident in recognizing PPD.</td>
<td>70 (64.8)</td>
<td>38 (35.2)</td>
</tr>
<tr>
<td>I am confident in giving counselling to mothers with PPD.</td>
<td>56 (51.9)</td>
<td>52 (48.1)</td>
</tr>
<tr>
<td>I am comfortable in talking with postpartum mothers about depression.</td>
<td>67 (62.0)</td>
<td>41 (38.0)</td>
</tr>
<tr>
<td>It is rewarding to care for mothers with PPD.</td>
<td>62 (57.4)</td>
<td>46 (42.6)</td>
</tr>
</tbody>
</table>

Of the 108 participants, only 28 (25.9%) of them had ever conducted PPD screening. Twenty (18.5%) of the participants were aware of the availability of PPD screening tools, but only 15 (13.9%) of them used it in their clinical practice. When they used a tool, it was the DASS-21.

Logistic regression analysis showed that only the number of children (OR=1.44, 95%CI=1.06-1.95, P=0.021), the number of years in nursing practice (OR=1.06, 95%CI=1.01-1.13, P=0.033) and MCH (OR=1.09, 95%CI=1.02-1.16, P=0.012) were associated with having ever practiced PPD screening.

Between the screening and no-screening groups, three statements with significantly different responses were identified, which were “It is rewarding to care for mothers with PPD” (P=0.029), “I am confident in recognizing PPD” (P=0.010) and “I am confident in giving counselling to mothers with PPD” (P=0.016).

Multivariate logistic regression analysis showed that participants who agreed that screening for PPD takes too much time were less likely to have ever conducted PPD screening (AOR= 0.13, 95% CI=0.02–0.74, P=0.022), while participants who agreed that screening for PPD was their responsibility were more likely to have ever conducted PPD screening (AOR=14.12, 95% CI=1.65–120.75, P=0.016). The knowledge score had no significant association with PPD screening practice (P=0.408).

**Discussion**

PPD, a topic integrated into the midwifery curriculum, is not unfamiliar to the nurses in our study. Eighty-seven percent of them received PPD training through attending seminars or courses, including through continuing medical education (CME) or continuing nursing education (CNE) courses. They scored well on the knowledge component, with the exception of the treatment domain. Nurses are not involved directly in PPD treatment, thus only a few have knowledge concerning the use of antidepressants in breastfeeding mothers and the use of electroconvulsive therapy in PPD. It is worrying that nurses did not know the definition of postpartum blues, about paternal PPD or that consumption of “methyldopa” is a risk factor for PPD. Education may focus more on these topics in future.

In our study, we observed that PPD screening practice had no significant association with the knowledge score. Nurses’ knowledge levels did not reflect their actual care delivery. This theory-practice gap has been addressed widely worldwide. Apart from having good knowledge, clinical skills are required...
to identify mothers with the symptoms and risk factors associated with PPD. Midwifery training focusing on both theory and clinical practice is lacking. Efforts to minimize this gap are crucial.

Among our study population, none of the participants reported having their own experiences with PPD, and only four participants (3.8%) reported having a family history of PPD. Compared to the worldwide (10-15%)\(^1\) and local (14.3%)\(^4\) prevalence rates, these rates are low. It is likely that there may have been response bias in the self-reporting of PPD since close to half of the nurses agreed that PPD is a social stigma. Nurses with this belief may avoid discussion about depression with postpartum mothers as well.

The socio-cultural beliefs that “mothers prefer alternative treatments for their depression” and “it is our culture that depressive mothers do not discuss depression with nurses” were reported in a qualitative study conducted by Jalil in a rural area in Malaysia.\(^7\) Although the use of alternative treatments in rural areas is higher,\(^16\) many of our nurses in Kepong, an urban area, also agreed with these beliefs. We hypothesized that these beliefs may have an association with the PPD screening practices. However, that was not the case in this quantitative study.

Up to 94% of the nurses agreed that screening for PPD is necessary, but only 78% perceived it as their responsibility. Leiferman et al. reported that those who felt responsible for identifying PPD were more likely to assess postpartum mothers for PPD and manage PPD actively.\(^11,13\) Similarly, our study also showed a positive association between the belief that “screening for PPD is my responsibility” and screening practice. When given more opportunities to see postpartum mothers, nurses should be empowered to perform the screening. In order to make them more aware of this responsibility, the screening can be integrated into the scope of their jobs and motivational training can be utilized.

On the other hand, nurses who agreed with the statement that “screening for PPD takes too much time” were less likely to have ever performed PPD screening as compared to those who did not agree. Time is a limitation. Excessive workloads and staff shortages are common in most areas of the health care system.\(^17\) This situation results in poorer job performance and patient care.\(^18,19\) In addition, increasing pressures in terms of work productivity and lack of reward may make this screening a low priority for nurses in this working environment. Therefore, the PPD screening process must be simple and not time consuming, as nurses are also overloaded with paperwork on top of their usual clinical work.

Bandura’s theory of self-efficacy suggests that a person’s perception of their ability to perform an activity can play a major role in how the person approaches a task or challenge. Those who believe they can do well are more likely to master a difficult task rather than avoid it. Our nurses need more practical training to improve their confidence levels in recognizing and providing counselling to mothers with PPD.

The poor PPD screening practices found in our study were observed by Golbasi et al.,\(^10\) but stand in contrast to the results of a study conducted by Zander.\(^20\) The contrasting results might be due to the different study populations used in the studies. Golbasi et al. recruited nurses and midwives in the primary health clinics, which was similar to our study setting. On the other hand, Zander enrolled certified nurses and midwives from the American College of Nurse-Midwives 50th Annual Meeting, and only those who provided postpartum care for at least 10 hours a week were included in the study. The participants in Zander’s study were likely to be better trained and more enthusiastic.

A screening tool is useful and necessary for universal screening. Despite numerous validated screening tools being available, it is not surprising that our nurses were only familiar with the DASS-21, as it is used for mental health screening in Malaysia. The DASS-21 consists of 21 items covering three components, namely, depression, anxiety and stress. Compared to the EPDS, which has 10 items, and the two-question screening test, which has 2 items, more time is needed to complete the DASS-21 questionnaire. Likewise, the scoring method and interpretation of results used for the DASS-21 is more complicated. Hence, these issues might lead to poor utilization of the screening tool.

Additional studies are required to determine
the best screening tool for daily practice. Nurses need to be trained on how to use it. In view of time being a great concern in performing screening, mothers could fill in the screening tool while waiting for their postpartum check-up at the clinic. A clear flow chart for the screening process and subsequent management of mothers who are screened as positive for PPD would be helpful.

This study was limited by the self-reported questionnaire, which carried the risk of response bias. Due to the time constraints, the questionnaire had not gone through full validity and reliability testing. As this study was conducted in one single district, the degree to which the findings can be generalized is limited. Also, the study did not account for nurses from the private sector who carry out MCH services.

Conclusion

Although the majority of the nurses scored above the median total knowledge score and had positive beliefs towards their role in PPD treatment, their practices in terms of PPD screening remained poor. The predictors of having ever performed PPD screening were their self-perceived responsibility in doing screening and their lack of agreement with the statement that screening takes too much time. Knowledge score was not associated with screening practice. Interventions to improve PPD screening practices should not only aim to improve knowledge but also consider strategies to change the beliefs among nurses.

Acknowledgements

We thank the expert panel members for their input in developing the questionnaire, Kepong District Health Office for allowing us to conduct this study in all the maternal and child health clinics and the nurses for their participation in this study.

Competing Interest

None.

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An active boy with bilateral knee pain

Nur Suhaila I, Siti Suhaila MY, Wan Aireene WA


Case summary

A 14-year-old boy presented to an outpatient clinic with intermittent bilateral anterior knee pain for the past year that was relieved by rest. He was actively involved in sports and frequently played football in between the pain episodes but had no history of trauma or falls. He described the pain as throbbing in nature, especially upon applying pressure (kneeling during prayer). The pain was aggravated by exercise, particularly playing football, and was temporarily relieved by taking paracetamol. He reported that the bone just below both anterior knees appeared to have become more prominent since 2 months ago. There was no knee joint swelling, and no systemic symptoms, such as fever, loss of appetite, weight changes or fatigue, were present.

A physical examination revealed prominent swelling of the bilateral tibial tuberosity, with tenderness on pressure. However, there was no overlying erythema or limited range of motion with tenderness over the joint line of either knee and no knee joint effusion. Figures 1 and 2 show the findings of a left and right knee radiograph.

Figure 1. A lateral radiograph of the left knee

Figure 2. A lateral radiograph of the right knee

Questions

1. State the radiograph findings in Figures 1 and 2.
2. What is the diagnosis and what are the risk factors associated with your diagnosis?
3. How would you manage the above condition?

Answers

1. Figure 1 shows irregular sclerosis with fragmentation of the tibial tuberosity (red arrow). Figure 2 presents a lateral radiograph of the right knee, showing fragmentation of the tibial tubercle (A), with overlying soft tissue swelling (B), thickening of the patellar ligament (C) and the indistinctiveness of the infrapatellar fat pad (D).

2. The clinical diagnosis was Osgood–Schlatter disease (OSD). The diagnosis of OSD was based on the patient’s history and clinical examination and was supported by the radiography findings.1,2 This patient had knee pain, in addition to swelling and tenderness, especially when...
direct pressure was applied to the tibial apophysis/tibial tuberosity. The pain was aggravated by physical activities. A plain radiograph is usually obtained to exclude other causes of knee pain (i.e., patella tendon avulsion). In the early stage of OSD, a plain radiograph does not normally show any abnormalities. In the present case, plain radiography revealed that both knees were affected (Figs. 1 and 2). Tibial tubercle fragmentation is seen bilaterally and usually appears 3–4 weeks after acute onset of pain. Some practitioners may find it difficult to differentiate OSD from avulsion fractures. Features suggestive of acute tibial tubercle avulsion are sudden onset of pain without preceding symptoms in the region of the tibial tubercle and inability to ambulate.

The risk factors for OSD are age (females: 8–12 years; males: 12–15 years), being male (3:1), rapid skeletal growth and repetitive sprinting and jumping sports. In addition to the patient’s sex and age, the main risk factor in the current case was regular intense sports activity. This patient frequently played football in between the pain episodes.

3. OSD is a self-limiting condition. About 90% of patients respond well to non-operative treatment approximately 1 year after the onset of symptoms. A complete recovery is expected in most cases following the closure of the tibial growth plate. Closure generally occurs around the age of 18. However, some patients may have tenderness over an unfused tibial tubercle ossicle or a bursa, which can cause persistent problems in kneeling. The management of OSD is conservative and involves symptomatic treatment to relieve pain and swelling. It includes pharmacological treatment and physical therapy. The pain may take up to 6–24 months to resolve. Pharmacological treatment with non-steroidal anti-inflammatory drugs helps to relieve the pain. However, such treatment has not been shown to shorten the course of OSD. This patient was prescribed 250 mg of mefenamic acid PRN, and his pain was controlled.

Activity limitations or a graded reduction in activity during the acute phase, physical load restrictions, the application of ice (10–15 minutes, up to 3 times a day), stretching of the lower extremity musculature and strengthening of the quadriceps have all been shown to decrease OSD-related pain and inflammation. Long-term immobilization may result in increased knee stiffness in mild cases and therefore is contraindicated. Pain-producing activities, such as sports that involve excessive jumping, should be avoided. Protective padding (i.e., infrapatellar strap/pads) may also be used, but its efficacy has not been proven, except in a small case series in which an infrapatellar strap was used.

There is limited research on the effectiveness of physical therapy modalities in treating OSD. Suggested modalities include electrical stimulation, such as Radial Shock Wave Therapy (RSWT) and Transcutaneous Electrical Nerve Stimulation (TENS), in addition to cryotherapy, hydrotherapy (whirlpools and contrast bath therapy), light agents (infrared and laser), sound agents (ultrasound) and thermotherapy. A recent study of adolescents with recalcitrant OSD in Argentina reported that treatment with hyperosmolar dextrose injections reduced OSD-related symptoms significantly. Our patient was treated with ultrasound, and his symptoms improved greatly.

Surgery is rarely indicated in OSD. Occasionally, patients who have a large ossicle and an overlying bursa may experience intolerable pain upon kneeling, and this pain may continue into adulthood. Such patients may be candidates for surgical treatment. Numerous surgical techniques for OSD have been prescribed, with variable results. Surgical excision of the bony fragment and/or free cartilaginous material through arthroscopic techniques seems to be the best surgical treatment choice.

Funding: None

Consent: The parent of the patient consented to the article and radiograph.

Conflict of interest: None
How does this paper make a difference to general practice?

This paper highlights the common presentation of an adolescent with Osgood-Schlatter disease. A knee x-ray also highlights the common findings in OSD, which is almost always misdiagnosed as a fracture among doctors. The discussion concerning the management of OSD is also very important to primary care doctors, especially as it concerns the principals behind the management of OSD.

References


**Isolated sphenoid sinusitis: A big headache.**

Ishak NL, Subha ST, Abu Bakar S

**CASE REPORT**

**Introduction**

Isolated sphenoid sinusitis is a rare clinical entity with potentially devastating complications such as cranial neuropathies, cavernous sinus thrombosis, meningitis and intracranial abscess. It accounts for only 2.7-3.0% of all paranasal sinus diseases. A patient may present with myriad symptoms, ranging from occipital or vertex headache, retro-orbital pain, otalgia, drowsiness to meningitis-like symptoms. With these non-specific and varied symptoms, patients are usually not referred to an otorhinolaryngologist, which contributes to further delay in diagnosis and proper management. Prompt and accurate diagnosis is necessary in order to avoid catastrophic complications due to the proximity of the sphenoid sinus to vital neurovascular structures.

**Case Report**

An 18-year-old male presented to the emergency department with a 12-day history of occipital headache and retro-orbital pain. He subsequently became drowsy. He had no seizures, photophobia or neck stiffness. He denied any ear, nose or throat symptoms. On examination, there was no mastoid swelling or tenderness. Nasoendoscopy revealed congested bilateral inferior and middle turbinates, and the adenoids appeared to be inflamed. A computed tomographic (CT) scan of the brain was performed at the emergency department to rule out meningitis or intracranial abscess. The patient was admitted and started on intravenous (IV) Ciprofloxacin. In view of the fact that there was no clinical improvement after 24 hours, a contrasted CT scan of the brain and paranasal sinuses was performed. An isolated left sphenoid sinusitis was seen on the HRCT scan with dilatation of the left cavernous sinus and no evidence thrombosis. We proceeded with a left sphenoidotomy via a direct transnasal approach and about 2ccs of pus drained. There was no mass or fungal ball in the sphenoid sinus.

The patient made a remarkable improvement postoperatively. The intense headaches resolved completely, and he tolerated well orally. We continued the IV Ciprofloxacin for one week, and he was then discharged with a 6-week course of oral antibiotics. The patient remained well under follow up.

**Image 1.** An axial cut of a CT scan of the paranasal sinuses which shows isolated right sphenoid sinusitis.

**Image 2.** A coronal cut of a CT scan of the paranasal sinuses which shows isolated right sphenoid sinusitis.

**Discussion**

Isolated sphenoid sinus disease usually presents with atypical headaches of various intensities and locations that are unresponsive to analgesics and exacerbated by head movements. The headaches can be located in the vertex, frontal, temporal, periorbital, and occipital regions. These varied locations can be explained by the sensory innervation of the sphenoid sinus, which is innervated by...
the trigeminal nerve, and the afferent fibers from the sphenopalatine ganglion. The serious pathology of the sphenoid sinus may remain totally asymptomatic until complications have emerged.

Nasoendoscopy is an important diagnostic tool for paranasal sinuses pathologies; however, the findings in patients with isolated sphenoid sinus disease may not be obvious. According to Sethi et al., the normal appearance of the sphenoethmoidal recess does not exclude sphenoid pathology.\textsuperscript{4} Reports have shown that nasoendoscopy failed to demonstrate any pathological abnormalities around the sphenoidal ostium in as many as 50\% of cases.\textsuperscript{5}

The clinical presentation of isolated sphenoid sinus pathology is often vague and non-characteristic. For this reason, patients are usually not referred immediately to the otorhinolaryngologist,, which may delay diagnosis further.

A CT scan is an important tool in diagnosing patients suspected of having sphenoid sinus disease. Often enough, isolated sphenoid sinus disease is an incidental finding during a radiological investigation for atypical headaches, as per our case.

\textbf{Conclusion}

The diagnosis of isolated sphenoid sinus disease is often made radiologically, as symptoms and signs are nonspecific. A normal nasal endoscopic examination does not exclude sphenoid sinus disease. A diagnosis of isolated sphenoid sinusitis need to be entertained when patient presents with atypical headaches in order to avoid catastrophic complications.

\textbf{How does this paper make a difference to general practice?}

This paper highlights the importance of recognizing isolated sphenoid sinusitis as a potential cause of headache. This diagnosis is often missed or delayed due to the non-specific presentation. Headaches which are not responding to conservative treatment should be referred to tertiary settings for further assessment to avoid catastrophic life-threatening complications.

\textbf{References}

CASE REPORT

Pseudohypoparathyroidism: A case of hypocalcemia and hypothyroidism diagnosed during the postpartum period

Lim KP, Yong SL

Lim KP, Yong SL. Pseudohypoparathyroidism: A case of hypocalcemia and hypothyroidism diagnosed during the postpartum period. Malays Fam Physician. 2019;14(1);31–34.

Keywords:
pseudohypoparathyroidism, hypocalcemia, Albright's hereditary osteodystrophy

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Abstract

We describe a 29-year-old Para 1 post-Emergency Lower Segment Caesarean Section (EMLSCS) for fetal distress and Preterm Rupture of the Membrane (PROM) referred by the Obstetric team for persistent bradycardia. She had the typical features of Albright's Hereditary Osteodystrophy (AHO). The laboratory investigation revealed hypocalcemia, hyperphosphatemia with a high Parathyroid hormone (PTH) level and low free Thyroxine 4 (FT4) with high Thyroid Stimulating Hormone (TSH). The patient was diagnosed with Pseudohypoparathyroidism (PHP) Type 1A associated with TSH resistance based on the somatic features of AHO present as well as biochemical and radiological abnormalities.

Introduction

Pseudohypoparathyroidism (PHP) is a heterogeneous group of disorders defined by targeted organ (kidney and bone) insensitivity to parathyroid hormone (PTH). It is characterized by hypocalcemia, hyperphosphatemia and an elevated serum concentration of parathyroid hormone (PTH).

PHP can be subdivided into several distinct entities (Types 1A, 1B, 1C and 2) and pseudo-pseudohypoparathyroidism (Pseudo-PHP). PHP Type 1A is caused by the loss of function of one allele of the gene encoding the stimulatory G protein alpha subunit (Gsα), which, in turn, blunts the response of urinary Cyclic Adenosine Monophosphate (cAMP) to exogenous PTH. It is associated with primary hypothyroidism and hypogonadism due to the malfunction of the G protein leading towards resistance to Thyroid Stimulating Hormone (TSH), Lutenising Hormone (LH) and Follicle Stimulating Hormone (FSH).

PHP Types 1A and 1C both have features associated with Albright’s Hereditary Osteodystrophy (AHO) and are characterized by heterogeneous clinical findings, such as brachydactyly, rounded face, short stature, central obesity and subcutaneous calcifications in conjunction with variable levels of mental retardation. PHP Type 1B can be easily differentiated clinically from PHP Types 1A and 1C through the presence of normal phenotype/ somatic features. The differentiation between PHP Type 1A and PHP Type 1C requires genetic analysis of erythrocyte Gsα activity.

Type 2 PHP is characterized by resistance to PTH in the absence of AHO, along with resistance to other hormones, while pseudo-PHP is characterized by the presence of AHO and the absence of any hormone resistance.

Case report

A 29-year-old Para 1 post- Emergency Lower Segment Caesarean Section (EMLSCS) for fetal distress and Preterm Rupture of the Membrane (PROM) was referred by the Obstetric team for persistent bradycardia. She was previously healthy and well. She booked late at the antenatal clinic at 28 weeks. She denied any hypocalcemic, hypothyroid and hypogonadal symptoms antenatally; however, bradycardia was recorded in her antenatal book. She had normal, regular menses and had planned for this pregnancy since marrying in 2015. Her family history was unremarkable. She had had learning disabilities since childhood, and she did not complete her primary school education. She is a housewife and is able to perform daily housework.

On examination, her vital signs were stable with bradycardia at 50-55 beats per minute. Anthropometry showed proportionate short stature (Figure 1), with a height of 114 cm and weight of 44 kg. Her body mass index (BMI) was 34 kg/m². She had typical features of AHO, which included round face, short stature and neck, obesity, brachydactyly with shortened metacarpals and metatarsals, and
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A slight learning disability (Figure 1-4). No goitre was present, and her deep tendon reflexes were normal. Chvostek and Trousseau’s signs were negative. Her cardiovascular, respiratory and abdominal examinations were unremarkable.

The laboratory results were as follows:

- **Corrected Calcium**: 1.87 mmol/L (Normal Range (NR) 2.1-2.6)
- **Phosphate**: 1.81 mmol/L (NR 0.87-1.5)
- **PTH**: 18.1 pmol/L (NR 1.6-6.9)
- **Creatinine**: 63 mmol/L (NR 53-106)
- **fT4**: 10.62 mIU/L (NR 11.8-23.2)
- **TSH**: 17.3 mIU/L (NR 0.35-5.5)
- **Antithyroid Peroxidase**: Negative

Fig. 1 Features of AHO include short stature, disproportionate shortening of the limbs, and round, flattened face.

Fig. 2 Brachydactyly of both hands, with the shortened 4th and 5th fingers, the greatly foreshortened terminal 1st digit, and short, wide thumbnail (potter’s thumb).

Fig. 3 Fist with the characteristic ‘dimples’ over the 4th and 5th digits replacing the knuckles formed by the distal head of normally-sized metacarpal bones (Archibald sign).

Fig. 4 Brachydactyly of the feet, with the short 4th and 5th toes.
Hand radiography showed bilateral shortening of the fourth and fifth metacarpal bones (Fig. 5). The patient was diagnosed with PHP Type 1A associated with TSH resistance on the basis of the somatic features of AHO and biochemical abnormalities.

She was treated with levothyroxine, a calcium supplement and activated Vitamin D. Family screening was planned, and her newborn was referred to a pediatrician for screening.

Discussion

PHP is a heterogeneous disorder with a variety of manifestations. The prevalence of the disorder is about 0.79 per 100,000. In 1942, Fuller Albright first introduced the term pseudohypoparathyrodism to describe patients with hypocalcemia and hyperphosphatemia with normal renal function who had no calcemic and phosphaturic response to bovine parathyroid extract as compared to hypoparathyroid patients. PHP1A is characterized by parathyroid hormone resistance (elevated PTH in spite of the hypocalcemia and hyperphosphatemia; poor cAMP and phosphaturic response to exogenous PTH administration) along with the features of AHO described above. The elevated serum concentration of PTH in a patient with hypocalcemia, hyperphosphatemia, and normal renal function excludes hypoparathyroidism and is suggestive of PHP. Often a definitive diagnosis requires careful examination of radiographs of the hands and feet.

PHP Type 1A is also associated with primary hypothyroidism and hypogonadism due to the malfunction of the G protein, leading towards resistance to TSH, LH and FSH. Typically, the patients do not have goiters and the antithyroid antibodies are negative. The serum fT4 level may be low or low-normal with elevated TSH. Hypothyroidism may occur early in life prior to the development of hypocalcemia. Reproductive dysfunction occurs commonly in subjects with PHP Type 1A. Unlike this patient, women may exhibit delayed puberty, oligomenorrhea, and infertility. Features of hypogonadism may be less obvious in men, but fertility appears to be decreased, as well.

The long-term treatment of hypocalcemia in patients with hypoparathyroidism involves the administration of oral calcium and activated vitamin D. Treatment of PHP and pseudo-PHP is similar to that of hypoparathyroidism, except that the doses of vitamin D and calcium are usually lower than those required in true hypoparathyroidism. The goals of therapy are to maintain normal thyroid function and serum calcium and phosphate concentration.

Hypothyroidism has been associated with an increased risk of several complications in pregnancy, including low birth weight, preeclampsia, gestational hypertension, preterm delivery, increased rate of cesarean section, postpartum hemorrhage, perinatal morbidity and mortality as well as neuropsychological and cognitive impairment in the child. On the other hand, a recent meta-analysis of 12 studies found that routine calcium supplementation during pregnancy may reduce the risk of preeclampsia and maternal mortality. The effect was more marked in women at high risk of calcium deficiency.

The patient was asymptomatic for hypothyroidism and hypocalcemia throughout her childhood and pregnancy, resulting in no
earlier attention. Furthermore, she was able to conceive despite the possible gonadotropic resistance associated with PHP Type 1A. However, she did present with asymptomatic bradycardia during antenatal follow up. Early diagnosis could not only have led to prompt treatment for this patient, but it can also reduce obstetric risks and complications of hypothyroidism as well as hypocalcemia for both the mother and her fetus.

**Conclusion**

Early recognition of PHP is essential to prevent delay of the diagnosis and treatment, further reducing the risks of obstetric complications.

**Conflict of interest**

The authors declare that there is no conflict of interest.

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This case was presented as a poster at the 7th Malaysian Endocrine & Metabolic Society (MEMS) Annual Congress on 19-22 May 2016 at Kuala Lumpur, Malaysia.

**How does this paper make a difference to general practice?**

- It creates awareness among clinicians regarding pseudohypoparathyroidism (PHP) as a rare disease involving hypocalcemia and hypothyroidism.
- It highlights the implications of undiagnosed hypocalcemia and hypothyroidism for a pregnant mother and her fetus.
- It shows that a thorough history taking and physical examination, including heart rate monitoring, would have led to further investigation in this particular case.
- An early high index of recognition of PHP can prevent delay of the diagnosis and treatment.
- It also emphasizes the importance of family and genetic screening in patients with PHP.

**References**


"The best interest of the adolescent": Exploring doctors' decision to proceed with treatment of sexual reproductive health without parental consent

Iriane I, Sajaratulnisah O, Farah ND


**Keywords:** adolescent; sexual and reproductive; consent; do no harm; best interest; qualitative study

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**Introduction:** Adolescents below the age of majority require parental consent for treatment or else the treating doctor may be liable for trespass and assault. This creates a dilemma for frontline doctors, as involving parents in the discussion could add yet another barrier to the existing barriers for adolescents in terms of access to healthcare services.

**Aim:** This paper seeks to explore doctors’ treatment decisions made without parental consent when managing adolescents presenting with sexual and reproductive health issues.

**Methods:** Based on a qualitative approach, in-depth interviews with 25 doctors throughout Malaysia were conducted. All audio-recorded interviews were transcribed verbatim and analyzed using a thematic approach.

**Results:** Generally, doctors weigh any decision by examining the health risks and benefits involved. While fear of litigation influences treatment decisions, a strong adherence to the ethical duty of ‘do no harm’ outweighs other considerations. When all options are risky, choosing what is considered ‘the lesser of two evils,’ i.e., what is perceived to be in the best interest of the adolescent, is adopted.

**Conclusions:** The complexity of a medical decision related to adolescent SRH issues is increased further when legal requirements are not in synch with the ethical and personal values of doctors. The laws relating to parental consent should be promulgated with a provision allowing doctors to exercise discretion in terms of treating specific SRH issues without parental consent.

**Introduction**

Studies have reported that adolescents with sexual and reproductive health (SRH) issues may be generally reluctant to discuss their health problems or access needed care. This reluctance becomes even more evident if parents are to be notified. Adolescents below the age of 18 are considered to be minors and thus have no legal capacity to provide consent according to Malaysian law. Frontline doctors face challenges when deciding to proceed with managing adolescents without the presence of parents or guardians or their consent in view of the risk of litigation and the revocation of the annual practicing certificate. On the other hand, insisting that parental consent be obtained while ignoring the adolescent’s preference increases the risk of the adolescent utilizing unsafe and illegal healthcare services in cases of pregnancy and abortion or spreading sexually-transmitted infections or diseases. The dilemmas faced by doctors when making treatment decisions with or without parental consent is certainly complex and real. Medical decision-making requires both clinical and non-clinical considerations; a patient's specific characteristics, both physical and non-physical, as well as legal and sociocultural considerations. The doctor's circumstances have also been recorded as influencing decision-making, shaping patterns of variation in clinical practice. Inter-practitioners' variations in clinical activities and practices either at the primary care or hospital level are partly attributable to doctors' characteristics while also depending on the clients' individual circumstances. Consideration of the perceived best interest of the patient in the process of decision-making is well documented in the literature, irrespective of the pros and cons of its application.
Despite the abstract and subjective nature of its application, the best interest of the patient has been an important theme in decision-making, particularly in the case of end-of-life decisions. The benefits and burdens of decisions in terms of the diagnosis and treatment of the patient are considered when determining what is in the best interest of the patient. In this regard, it has been suggested that the question of to treat or not to treat should be addressed by offering an approach consistent with an understanding rooted in the traditional medical ethics of autonomy, beneficence and the sanctity of life. However, it is not clear how doctors apply these ethical principles within the legal mandate for parental consent. Hence, understanding doctors’ experiences in dealing with adolescent SRH cases is pertinent when exploring their exercising of discretion and treatment decisions made without parental consent. An understanding of the complexity of the decision-making undertaken by frontline doctors and how well the current laws are serving the needs of the community can facilitate a reshaping of the current legal requirements for the benefit of all.

Methods

We conducted in-depth interviews using a semi-structured interview guide with doctors practicing at the public and private health facilities throughout Malaysia. They were recruited using purposeful sampling based on their gender, religion, postgraduate qualifications and practice experience, particularly in dealing with adolescents’ SRH, through which a snowball technique was adopted. Saturation of the data was achieved at 19 participants. However, further interviews were conducted to confirm the findings. Ethical approval was obtained from the Medical Research and Ethics Committee (MREC) of the Ministry of Health through the National Medical Research Register (NMRR-13-1564-18750 (IIR). The participants were supplied with a formal letter and necessary documents, such as the Respondent Information Sheet and the Informed Consent Form for an interview and audio recording. Participants’ backgrounds have been kept confidential and anonymous.

The in-depth interviews and written documents, legal or otherwise, were used to triangulate the data, in particular those relating to the understanding of and practice concerning the consent requirement, while field notes were used reflectively during data analysis. The interviews were audio recorded and transcribed verbatim. The completed and checked transcripts were imported to QSR NVivo Version 10 to assist with data management and analysis. Analysis included reading, sorting, analyzing and categorizing the textual data in the transcripts.

Two researchers worked on five transcripts and agreed on a coding framework. The first author then proceeded with the analysis of the rest of the transcripts, along with frequent discussions with the other researchers. The data was explored by reading the texts repeatedly to truly understand participants’ descriptions of their experiences, followed by a more detailed ‘open coding’ accomplished by reading each and every line of the interview transcripts. During this first coding cycle, various text segments that shared similar meaning were put under the same codes while others were given new codes. Further analysis involved the identification of similarities and differences among the codes within the same transcript. This process involved the reorganization and reconfiguration of the codes in order to develop a smaller and more select list of broader categories. At this stage, codes were recoded as needed and then similar codes were assembled together under the same broader category in order to analyze their commonalities. The various categories were then compared in order to see what connections, similarities and differences existed between them. Then similar categories were clustered under one theme. The themes developed for the first analyzed transcript were used later to help orient the subsequent analysis. In analyzing subsequent transcripts, comparison was made not only to the codes and categories within the same transcript but also to the codes and categories across other transcripts.

Results

Participants’ profile

The 25 participants were recruited from different parts of Malaysia and had clinical experiences ranging in duration between 13 and 50 years. There were 11 primary care physicians. The rest were specialists including obstetricians, paediatricians, adolescent health specialists and reproductive health specialists. Nine male doctors and 16 female doctors participated. Five participants were from the private sector, two were from the University hospital, one came from a statutory body and the remaining 17 were attached to either primary care clinics or public hospitals.
**Ethical duty outweighs legal duty**

Fear of legal consequences was reported as an influence on participants’ decisions when managing adolescent issues. The perceived legal duty mandating parental consent placed doctors in a stressful and difficult situation, partly because survival in medical practice is tied to the medicolegal scenario.

“I would be worried to breach that actually, where the guardianship law says that for a child or anybody, whatever you want to do needs consent.” [Dr. H]

“Because our annual practicing license and everything is tied to the medical legal scenario, … you can be subjected to a Malaysian Medical council inquiry and your (practicing) license is at risk.” [Dr. G]

Although the legal age of majority (18 years old) becomes the first consideration, as it is specified in the law, other aspects surrounding each particular case are also considered and, at times, outweigh the age factor if the circumstances necessitate intervention.

“So, if positive for STI, immediately treat. If pregnant, immediately provide antenatal care. If you look at the law, it is as if we cannot treat without parental consent, but actually, we have been doing it for quite some time.” [Dr. T]

The most compelling influence when deciding on whether to provide care without parental consent is the perceived ‘ethical duty’ that is strongly related to the Hippocratic Oath. There is a perceived responsibility and duty to prevent, in good faith, any harmful risk and complication to the health of an adolescent patient regardless of parental consent. As such, the participants feel that they are duty bound to take care of the health of the adolescents despite acknowledging the fact that any such intervention with regards to underage adolescents without parent consent is in contravention of the culture and the law.

“As medical professionals, we are bound by our Hippocratic oath. We don't deny any medical assistance in term of even providing counseling and all that. We are bounded to that. That is our first priority. I suppose. Then probably the next one comes to the issue of legality. So, whether it is legally permissible or not, probably that will be the second issue.” [Dr. A]

**Do no harm**

The basic, yet most powerful ethical principle held by the participants in their medical practice is ‘do no harm.’ Although there was no single definition of ‘do no harm’ stated, it is extensively understood to extend beyond treating physical health to all other related matters affecting an adolescent’s general health and wellbeing directly. In applying this principle in their medical practices, the participants try to strike a balance between the risks and benefits of pursuing the treatment of adolescent patients.

“...because, actually, in the Hippocratic Oath, the first is do no harm, that is the first thing. If you cannot give good, do not harm the patient.” [Dr. T]

“My conscious will say I must not harm the patient and if I feel that by not giving the patient the treatment, I might harm the patient, then it is wrong. Sometimes, by withholding treatment purely on a point of law, you can be harming the patient.” [Dr. D]

The “do no harm” concept extends beyond the health of an individual adolescent to include others, particularly in cases of sexually promiscuous adolescents.

“Considering the fact that STI is very virulent, very fast spreading and it can spread among their close contacts, whoever they have intimate contact with will have it. That probably would be the first priority: to ensure that the infection will not cause any damage to them.” [Dr. G]

Participants also consider the potential harm to the adolescents in terms of certain parental reactions towards SRH issues. Hence, parental involvement is avoided if the participants perceive risks to the adolescent of receiving harmful parental treatment that then would lead to further negative implications.

“Probably some of them, like MSM (men having sex with men), would result in being kena buang (disowned) and so forth. I think this is more dangerous, more harmful to the patients. They become depressed, become suicidal and so forth. So, it depends on the situation.” [Dr. Q]

**The lesser of two evils**

The participants reported the possibility of negative perception from the community that adolescents are being encouraged to engage in more sexual activity when contraceptives are provided. Among the Muslim participants, all but two of them did not consider religion to be a hindrance to providing services to adolescents without parental consent, particularly in the case of providing contraception to a sexually active adolescent, as this is considered as less ‘evil’ than allowing adolescents to face the risk of pregnancy, abortion, abandoning their baby or even becoming a child abuser.

“You give contraception as if you encourage sexual intercourse, but when you think about when they have sexual intercourse and have delivered and abandoned the child, which one is worse? So, you
have to take which one is better than the worst one.” [Dr. W]

Moreover, the adverse outcome of not providing contraception that resulted in an unintended pregnancy reportedly results in higher risks of looking for an alternative, yet unsafe, mode of terminating the pregnancy.

“We run a risk of them not wanting to come to us and going to quacks. That is the sad thing. Going to quacks meaning they are not doctors, they will do illegal abortions. So, my worry is if we are going to be so rigid and say look, every case has to involve the parents, they may end up going to quacks and that is a dangerous thing.” [Dr. H]

The best interest of the patient

The best interest of the adolescent patient matters the most and is perceived to be in line with an express provision in the Convention of the Rights of the Child (CRC), to which Malaysia is a state party.

“So, I was very happy to do it for her because I felt that it was in her best interest. I always follow the CRC in the best interest of children.” [Dr. M]

However, there seem to be differences in the participants’ perceptions as to what constitutes the best interest of the adolescent patient. One participant feels that by putting herself in the position of the adolescent’s mother and treating the patient like her own son or daughter, she will be able to do the right thing and make the best decision for the health of the adolescent patient.

“So, my approach will be like: if this is my daughter, how would I be doing it?” [Dr. P]

The first approach views the best interest of the adolescent patient as primarily dependent on the health and specific circumstances of each adolescent. For a medically trained professional, the best interest of the adolescent patient is perceived to be best served by ensuring that the state of the patient’s emotional and physical health is safe and healthy. In the case of a suspected pregnancy, for example, a urine pregnancy test or ultrasound scan provides confirmation of an adolescent pregnancy. Allowing the adolescent to be examined regardless of parental consent provides an opportunity for uncovering more teenage pregnancy cases. As such, early interventions, such as a safe termination of pregnancy or antenatal care, could be offered.

“Then you can uncover a lot of teenage pregnancies at the early stage. Rather than close the door, they don’t come in, so you open the door and give them options.” [Dr. F]

According to this view, providing proper ante-natal care and follow-ups, even without parental consent, are perceived to be in the adolescent’s best interest because of the risks involved in teenage pregnancy.

“When we talk about specifically about pregnancy, teenage pregnancy, the priority is the patient, because pregnancy is not without risk and that risk is greater if she is a teenager. And so taking into account the best interest of the patient is the reason why we focus on treating the adolescent as any other pregnant patient.” [Dr. T]

In contrast to the above perspective, there are some participants who seem to be pro-parent. They embrace a ‘protective’ approach in the sense that the best interest of the adolescent patient is best served if their welfare, safety and health is taken care of. Further, those goals are achieved only by involving parents in his or her healthcare. According to this view, parental consent is needed when dealing with an adolescent patient, not because of legal implications but rather because, through this, parents would have knowledge of the adolescent patient’s health condition, could provide support and would be responsible for post-treatment care.

“I never give treatment without the parents. Because, to me, parents must know because should anything happen, who will take care of the child? You get what I mean? So, it’s more on that part, rather than protect me, you know. It’s more to protect the child.” [Dr. C]

“I want the parents to be there to be aware, so that they can support them throughout.” [Dr. O]

In addition, parental involvement will ensure continuity of care and supervision of the adolescent’s health and behavioral issues, particularly of those who are involved in risky behavior, such as being sexually active. This involvement is seen as necessary because the doctor sees the patient for a very short period of time; thus, there needs to be someone at home who will look after the adolescent’s general health and well-being, as well as their sexual behavior, in order for the intervention to succeed.

“Let me tell you, the patient sees you for one to two hours, right? If parents are not involved, how is this child going to be help? The child is going back to the family. I need the family to be my eyes and ears. If I don’t get the family involved, then I know my therapy is going to fail. So, you need the parents there.” [Dr. H]

This type of reaction comes about because of the perceived inability of the adolescent to suddenly stop the habit unaided. The reasoning goes that the possibility of adolescents reverting back to practicing healthy behaviors
through parental involvement and continuous supervision and care is higher than if the adolescents are left to their own devices.

"Parents’ involvement is very important. At least if the parents know the status of their own children, actually there is space for them to revert. Otherwise, they tend to repeat. Things get repeated and never end.” [Dr. U]

“(If) parents do not know what is actually happening in their (adolescent’s) life, they can easily go back to whatever they are doing.” [Dr. I]

Discussion

Decision-making in medicine is rarely simple, even in so-called simple cases. To assume otherwise is to misjudge the task of medicine and the power of organized medical knowledge and medical care. While various studies have explored the influence of clinical and non-clinical factors at the doctor and patient level, as well as the environment of the practice setting, this study adds to the existing knowledge about how those various competing factors are reconciled in the process of making decisions.

Certainly, fear of litigation influences treatment decisions. In a different study context, doctors were found to select much more conservative treatments for their patients than for themselves on the basis of the legal consequences of the decisions. Other studies reported that fear of litigation may influence doctors’ decisions regarding end-of-life care and resuscitative efforts and those decisions which involve surrogate or family concerns. However, the participants in this study have apparently examined and treated adolescents without securing parental consent in various circumstances regardless of their understanding of the law, particularly those adolescents who are found to be sexually active.

Although there is no hard and fast rule adopted by the participants in the process of making decisions regarding whether to provide healthcare services with or without parental consent, it is found that in weighing and reconciling the various factors, the participants give more weight to their ethical duty to ‘do no harm’. The emphasis is placed on the health risks and benefits involved in the decision and choosing the ‘lesser of two evils’ while being guided by the principle of the ‘best interest of the adolescent’. This stance is consistent with the World Medical Association International Code of Medical Ethics, which states that ‘a physician shall act in the patient’s best interest when providing care, the interest of the patient should always be promoted regardless of financial arrangements, the healthcare setting or patient characteristics such as decision making capacity, behavior or social status’.

The Convention on the Rights of a Child, to which Malaysia is a party, provides that the best interest of a child is a paramount consideration.

While there is no definitive and consensus meaning of ‘do no harm’ and ‘best interest of the patient’ among the participants, this study found that these guiding principles were found to have been applied quite extensively, i.e., not limited to the aspect of physical health only. As the literature indicates, consideration of the best interest of the patient in a medical intervention is not necessarily limited to therapeutic intervention. In term of saving lives or ensuring improvements or preventing deteriorations in patients’ physical or mental health, consideration of the best interest extends to broader ethical, social, moral and welfare considerations. It is apparent that those who are pro-parent and against adolescents be given the right to consent on their own had, in some instances, provided clinical interventions without parental consent, particularly for those suffering from STIs and/or in need of contraception because of their sexually active behavior. Similarly, those who seemed to be pro-adolescent have, in certain instances, decided that the adolescent requires supervision in order to ensure the successful treatment of the health condition, such as in the case of HIV/AIDS. Hence, the participants are all in agreement about not giving the absolute right to consent to the adolescent as well as not abstaining them absolutely from consenting under proper circumstances.

In the context of contraception and abortion, the application of ‘the lesser of two evils’ dominates clinical judgments in terms of providing the necessary interventions. Although providing contraception may be misperceived as an encouragement for an adolescent to be sexually active, not providing the same will expose them to contracting an STI and, in the case of girls, pregnancy. In terms of the termination of a pregnancy, the majority of the participants are of the view that terminating the pregnancy within the ‘safe period’ under the supervision and care of a healthcare professional is better than
allowing the same intervention to be carried out by untrained people, baby abandonment or child abuse to take place.\textsuperscript{28} Pregnancies with their associated risks, particularly among young mothers,\textsuperscript{29} and the spread of STIs are both perceived as greater evils that need to be prevented from occurring. Physicians’ social characteristics, including their religious values, are reported to have an influence on their decision-making.\textsuperscript{30} However, no obvious differences were found among Muslim participants and between Muslims and non-Muslim participants in this study in terms of their decision-making. This finding is similar to the findings of a different study that indicated that religiousness showed little variation and emerged as an insignificant independent variable in terms of the physicians’ decisions.\textsuperscript{31}

\textbf{Study limitation}

The participants are all specialists identified through the snowballing technique, thus limiting the ability to choose possible participants that best provide information for or against parental consent. Nevertheless, the differences that are present in the socio-demographics of the participants provide great diversity in terms of their exposures and experiences, both as previous medical doctors and current specialists in dealing with adolescent patients with SRH problems. Such variations have provided different perspectives on the phenomenon researched, leading to findings of high quality, detailed descriptions of the phenomenon and elucidation of significant common and shared patterns within that variation.

\textbf{Conclusion}

Making treatment decisions based on the ethical principle in contravention of the legal mandate for parental consent places the medical practitioner at risk of litigation and/or facing disciplinary action affecting his or her medical practice. However, as this study found, the complexities and dilemmas involved in making decisions concerning adolescents with sexual and reproductive health issues without parental consent extend beyond the age factor. What is best for the adolescent patient involves doing no harm by choosing what is medically perceived to bring more benefits and the ‘lesser evil’ to the health and wellbeing of the adolescent patient. Perhaps the law should be promulgated to acknowledge the complexity of the situation and to bestow certain discretionary authority to the medical practitioners to provide necessary intervention without parental consent in justified circumstances, particularly, in the case of the sexually active adolescent.

\textbf{Acknowledgments}

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\textbf{Author Contributions}

Farah Nini and Iriane conceived the initial research idea. Iriane conducted all the interviews and analyzed the data together with Sajaratulnisah. Both Iriane and Sajaratulnisah drafted the paper with feedback from Farah Nini.

\textbf{Conflicts of Interest}

The authors declare no conflict of interest.

\textbf{How does this paper make a difference to general practice?}

1. This paper highlights the challenges of managing adolescent health, in particular, sexual reproductive health (SRH), for doctors in ambulatory settings.
2. This paper provides an understanding of doctors’ decision-making processes as they try to fulfill the requirements of the law and local health guidelines on adolescent SRH.
3. The findings will initiate an evaluation of the current related policy and law taking into consideration the challenges faced by health service providers.
References


CASE REPORT

Skin eruption induced by dieting – an underdiagnosed skin disease in Malaysia

Goh SW, Adawiyah J, Md Nor N, Yap FBB, Ch’ng PWB, Chang CC


Abstract

Prurigo pigmentosa is an inflammatory dermatosis characterized by a pruritic, symmetrically distributed erythematous papular or papulo-vesicular eruption on the trunk arranged in a reticulated pattern that resolves with hyperpigmentation. It is typically non-responsive to topical or systemic steroid therapy. The exact etiology is unknown, but it is more commonly described in the Far East countries. Dietary change is one of the predisposing factors. We report on nine young adult patients with prurigo pigmentosa, among whom five were on ketogenic diets prior to the onset of the eruptions. All cases resolved with oral doxycycline with no recurrence. We hope to improve the awareness of this uncommon skin condition among general practitioners and physicians so that disfiguring hyperpigmentation due to delayed diagnosis and treatment can be avoided.

Introduction

Prurigo pigmentosa is an inflammatory dermatosis first described by Nagashima in 14 Japanese patients in 1978. The condition was quite rare until the last decade, when increasingly more cases were documented, and its clinical and pathological features were further defined. It is now evident that prurigo pigmentosa is not limited to patients of Far East origin, as previously thought.

The skin lesions in prurigo pigmentosa are characterized by symmetrically distributed pruritic papules arranged in a reticulated, net-like pattern that heals with pigmentation. Lesions typically affect depressed regions of the trunk in the mid-chest and mid-back.

Prurigo pigmentosa does not respond to topical and systemic corticosteroid therapy. Disease recurrence is another clinical feature. Dietary changes, vigorous exercise, diabetic ketoacidosis, friction and atopic diseases have been associated with prurigo pigmentosa. We present nine cases of prurigo pigmentosa to highlight dieting as a precipitating factor.

Methods

The medical records, photographs and histopathological slides were available for nine patients diagnosed with prurigo pigmentosa at three dermatology clinics in Kuala Lumpur, Malaysia (University Kebangsaan Malaysia Medical Centre, Ting Skin Specialist Clinic and Gleneagles Kuala Lumpur) between 2015 and 2017 and were reviewed retrospectively. Consent for photography was obtained from all patients. Diagnosis of prurigo pigmentosa was based on clinicopathological findings from the adapted criteria set by Boer et al. The duration of follow up ranged from 3 to 30 months.

Data from the medical records included demographics, previous medical history, disease presentation and duration, associated conditions, laboratory results, histopathological findings and treatment (duration and response).

Results

We encountered a total of nine patients who were diagnosed with prurigo pigmentosa by dermatologists in three dermatology clinics in Kuala Lumpur, Malaysia. Eight (88.89%) of the nine patients were females, resulting in a female-to-male ratio of 8:1. The mean age was 21.4 years (range of 16-37 years). Five (55.56%) of the patients were Chinese, and the rest (44.44%) were Malays. All patients had the characteristic eruptions, except one, who presented with the bullous variant of prurigo pigmentosa. The skin lesions consisted of symmetrically distributed patches of erythematous papules in a reticulated pattern interspersed with dark brown pigmentation in the same reticulated pattern (Figure 1). The lesions were extensive over the anterior and posterior trunk in four patients, and two patients had lesions that were localized to the chest and upper back. The chest, abdomen and
suprapubic areas were affected in two patients. One patient had reticulated bullous lesions as well as patches of reticulated erythematous papules and pigmentation. All patients reported pruritus, in particular, seven of them had mild pruritus, while two had moderate pruritus. Disease duration prior to diagnosis ranged from 2 to 24 weeks. Five (55.56%) patients were dieting for weight loss prior to the onset of eruption; three (33.33%) were on ketogenic diets, while one (11.11%) was on Atkins’ diet. Two of these patients combined dieting with vigorous exercise. Atopic diseases were reported in two (22.22%) patients. No trigger factors or concomitant diseases were found in four (44.44%) patients. Patient characteristics and clinical features are summarized in Table 1.

Skin biopsies were performed on two patients. Histopathological findings of spongiotic dermatitis with neutrophilic exocytosis were reported for Patient 4. Full thickness epidermal necrosis with separation at the dermal-epidermal junction, peri-adnexal lymphocytes and neutrophils were seen in Patient 9. The histopathology findings for both patients were inconclusive for prurigo pigmentosa. Diagnosis in all patients was confirmed by the presence of the characteristic skin eruptions, recognized trigger factors (in most patients), unsatisfactory response to both topical and/or oral steroids and resolution with doxycycline. All patients had complete response to doxycycline with no relapse. Similar responses were observed with different dosages of doxycycline, i.e., 100mg daily and 200mg twice daily. Patients whose eruptions were triggered by dieting were advised to resume normal diets. There were no recurrences despite wide variation in the treatment duration, which ranged from 2 to 8 weeks. Patient 5, who received doxycycline 100mg twice daily for 2 weeks, was followed up for 1 year and remained asymptomatic. Table 2 summarizes the treatments, treatment outcomes and recurrences for the nine patients.
Table 1. Demographical and clinical features of nine patients with prurigo pigmentosa

<table>
<thead>
<tr>
<th>Case no.</th>
<th>Age (years)/gender</th>
<th>Ethnicity/Occupation</th>
<th>Duration of active lesions (weeks)</th>
<th>Distribution of skin lesions</th>
<th>Pruritus</th>
<th>Trigger factors/association</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>26/Female</td>
<td>Malay/NA</td>
<td>3</td>
<td>Chest, abdomen, mid-back, suprapubic</td>
<td>mild</td>
<td>Atkins diet for 10 days, exercise, friction</td>
</tr>
<tr>
<td>2</td>
<td>37/Female</td>
<td>Chinese/housewife</td>
<td>2</td>
<td>Anterior and posterior trunk, abdomen</td>
<td>mild</td>
<td>Eczema, ketogenic diet 2 weeks</td>
</tr>
<tr>
<td>3</td>
<td>19/Female</td>
<td>Chinese/Student</td>
<td>2</td>
<td>Anterior and posterior trunk</td>
<td>mild</td>
<td>Ketogenic diet 2 weeks</td>
</tr>
<tr>
<td>4</td>
<td>19/Female</td>
<td>Malay/Student</td>
<td>24</td>
<td>Mid upper back</td>
<td>moderate</td>
<td>nil</td>
</tr>
<tr>
<td>5</td>
<td>18/Female</td>
<td>Chinese/Student</td>
<td>4</td>
<td>Anterior and posterior trunk</td>
<td>mild</td>
<td>nil</td>
</tr>
<tr>
<td>6</td>
<td>19/Female</td>
<td>Chinese/Student</td>
<td>2</td>
<td>Chest, abdomen, suprapubic</td>
<td>moderate</td>
<td>Ketogenic diet 1 month</td>
</tr>
<tr>
<td>7</td>
<td>16/Male</td>
<td>Chinese/Student</td>
<td>6</td>
<td>Anterior and posterior trunk</td>
<td>mild</td>
<td>nil</td>
</tr>
<tr>
<td>8</td>
<td>22/Female</td>
<td>Malay/Student</td>
<td>24</td>
<td>Chest</td>
<td>mild</td>
<td>nil</td>
</tr>
<tr>
<td>9</td>
<td>17/Female</td>
<td>Malay/Student</td>
<td>3</td>
<td>Brassiere distribution, lumbosacral</td>
<td>mild</td>
<td>Asthma, eczema, diet, exercise</td>
</tr>
</tbody>
</table>

Table 2. Summary of treatments, treatment outcomes and recurrences

<table>
<thead>
<tr>
<th>Case no.</th>
<th>Treatment</th>
<th>Time to resolution of active lesions (days)</th>
<th>Duration of treatment (weeks)</th>
<th>Duration of follow up (months)</th>
<th>Recurrences</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Doxycycline 200mg/day</td>
<td>10</td>
<td>8</td>
<td>9</td>
<td>Nil</td>
</tr>
<tr>
<td>2</td>
<td>Doxycycline 200mg/day (2weeks), followed by 100mg/day (4weeks)</td>
<td>21</td>
<td>6</td>
<td>12</td>
<td>Nil</td>
</tr>
<tr>
<td>3</td>
<td>Doxycycline 100mg/day</td>
<td>14</td>
<td>6</td>
<td>5</td>
<td>Nil</td>
</tr>
<tr>
<td>4</td>
<td>Doxycycline 100mg/day</td>
<td>28</td>
<td>8</td>
<td>30</td>
<td>Nil</td>
</tr>
<tr>
<td>5</td>
<td>Doxycycline 200mg/day</td>
<td>14</td>
<td>2</td>
<td>12</td>
<td>Nil</td>
</tr>
<tr>
<td>6</td>
<td>Doxycycline 100mg/day</td>
<td>14</td>
<td>4</td>
<td>12</td>
<td>Nil</td>
</tr>
<tr>
<td>7</td>
<td>Doxycycline 200mg/day</td>
<td>NA</td>
<td>2</td>
<td>NA</td>
<td>Nil</td>
</tr>
<tr>
<td>8</td>
<td>Doxycycline 200mg/day</td>
<td>14</td>
<td>4</td>
<td>3</td>
<td>Nil</td>
</tr>
<tr>
<td>9</td>
<td>Doxycycline 200mg/day</td>
<td>10</td>
<td>8</td>
<td>12</td>
<td>Nil</td>
</tr>
</tbody>
</table>

Discussion

Prurigo pigmentosa occurs mostly in young adult patients in their twenties with a strong female preponderance, as demonstrated by our group of patients. The mean age ranges from 21 to 26 years, while the male-to-female ratio is from 1:2.7 to 1:8.5-8 Both Malays and Chinese are affected. Interestingly, none of our patients was of Indian origin. However, the number of cases in this review is too small to reflect our country’s ethnic distribution of 63.1% Malays, 24.6% Chinese and 7.3% Indians.12 Although prurigo pigmentosa was initially linked to Orientals, it is now apparent that other ethnicities are affected to a certain extent.2 The condition is likely to become more prevalent as dieting and vigorous exercise become more common due to either increased health awareness or social and peer pressure to achieve certain body proportions.

The term prurigo pigmentosa used for this condition can be confusing. In terms
of ‘prurigo,’ pruritus was mild and not a main feature in most of our patients. In the remaining patients, it was of moderate severity. This result is similar to the finding in the study by Kim et al. in which more than half of their patients had mild or no pruritus.3 However, severe pruritus has been reported, especially in the early stages of the skin lesions.2,3 The word ‘pigmentosa’ suggests a pigmented disorder instead of an inflammatory disorder that resolves with post-inflammatory hyperpigmentation. The current classification of prurigo pigmentosa under hyperpigmentation disorders may require revision, as more knowledge of its pathophysiology and clinical features has emerged in recent years. In addition, prurigo pigmentosa may present with vesicles and blisters as the main clinical feature.7,15,14 The clue to diagnosis lies on the arrangement of the vesicles and blisters, which follow a reticulated pattern, with reticulated pigmentation observed once the lesions heal.

Eruptions of prurigo pigmentosa can be classified into early, late or recurrent as the lesions evolve.3 Early lesions consist of urticated papules or papulovesicles, whereas late lesions are reticulated hyperpigmented patches.3 Early lesions exhibit mostly neutrophil infiltration of the dermis.3 The majority of late and recurrent early lesions reveal predominance of lymphocytes over neutrophils.7 Epidermal hyperplasia and epidermal hyperpigmentation are observed frequently in late and recurrent early lesions.3 Due to the variable findings, histological confirmation of prurigo pigmentosa is difficult, as illustrated by our patients for whom a skin biopsy could not confirm the diagnosis; rather, the diagnosis was based on the classical clinical features.

Dieting was a distinctive triggering factor that induced prurigo pigmentosa among 55.6% of our patients. In the literature, dietary changes have been associated with prurigo pigmentosa in up to 50% of cases.3,8,15 In addition, states of starvation, malnutrition and diabetic ketoacidosis are other predisposing factors for the disease.3,6,9,14,16,17 Kim et al., in their retrospective study of 50 patients in Korea, did not find demonstrable elevated blood ketones, but 33% of the urine ketones measured were positive. Urine ketone was positive in 50% of patients who were dieting and 23% of those who were not on a diet.3 In about 50% of patients with prurigo pigmentosa reported by Oh et al., symptoms were precipitated by dietary changes, and ketosis was demonstrated in 75% of the cases.8 The inflammatory process in the pathophysiology of prurigo pigmentosa is unclear. Overexpression of interleukin-6 (IL-6), interleukin-8 (IL-8) and monocyte chemo-attractant protein-1 (MCP-1) induced by ketosis could account for the inflammation observed on the skin.38,19

Prurigo pigmentosa could be mistaken for eczema or contact dermatitis. Another differential diagnosis to consider is confluent and reticulated papillomatosis. Eczema has similar pruritic urticarial papules vesicles and patches. Eczema also has strong association with a personal or family history of atopy. However, the distribution of the lesions in prurigo pigmentosa differs from that observed in other endogenous eczemas, such as atopic eczema or seborrhic eczema. In the context of trunk involvement, contact dermatitis related to allergens, such as fragrances, nickel, fabric dye and topical medicaments, should be considered. Lack of exposure to suspected allergens and a negative patch test would rule out allergic contact dermatitis. Endogenous eczema and allergic contact dermatitis will respond well to topical or oral corticosteroid, unlike prurigo pigmentosa. Late presentation of reticulated lesions over the trunk can be easily mistaken for post-inflammatory hyperpigmentation or confluent and reticulated papillomatosis. In confluent and reticulated papillomatosis, the patient would have hyperkeratinized papillomatous lesions in a reticular pattern, which is not observed in prurigo pigmentosa.

Doxycycline is an effective therapy for prurigo pigmentosa.3,5 The dosage used ranges from 100mg to 200mg per day for 2 to 8 weeks in duration.3,5 Lower doses of doxycycline and shorter treatment durations produce similar responses, but the effect on relapses is difficult to determine due to limited data. There is no data on the most effective time frame of treatment or the benefit of treatment beyond a certain duration. The effect of doxycycline is probably due to its anti-inflammatory properties rather than its antimicrobial effect, as no microbial pathogen has thus far been identified as an etiological factor in prurigo pigmentosa. Minocycline and dapsone are other effective treatment options.3,8 Doxycycline, minocycline and dapsone are known to be effective in the prevention of the migration and function of neutrophils.3,8 We prefer doxycycline due to its more favorable side effects profile. In the proportion of patients where prurigo pigmentosa is triggered by
dieting, relapse may occur when dieting is resumed. 3

Conclusion

Dieting with or without resultant ketosis seems to be an important risk factor for prurigo pigmentosa. The diagnosis should be considered in young adults who are attempting to lose weight by means of dieting and presenting with a pruritic inflammatory symmetrical truncal papular or papulo-vesicular eruption with reticulated and confluent hyperpigmented macules. Early diagnosis and treatment may prevent disfiguring residual hyperpigmentation.

Conflicts of interest

None

Source of Funding

None.

How does this paper make a difference to general practice?

• Prurigo pigmentosa is an uncommon and lesser-known skin disorder which may be a diagnostic challenge to clinicians.
• The diagnosis of prurigo pigmentosa is made clinically.
• Early diagnosis and treatment aids in minimizing the disfiguring skin pigmentation.
• Identification and elimination of dietary risk factors is crucial in preventing relapse.
• An early referral to a tertiary center is recommended, as some patients may require a skin biopsy for diagnosis.

References

CASE REPORT

Pleuritic chest pain and fever: An unusual presentation of aortic dissection

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Keywords: Aortic dissection, aortic dissection detection risk score, chest pain, elevated C-reactive protein

Abstract

It remains a challenge to diagnose aortic dissection in primary care, as classic clinical features are not always present. This case describes an atypical presentation of aortic dissection, in which the patient walked in with pleuritic central chest pain associated with a fever and elevated C-reactive protein. Classic features of tearing pain, pulse differentials, and a widened mediastinum on chest X-ray were absent. This unusual presentation highlights the need for a heightened level of clinical suspicion for aortic dissection in the absence of classic features. The case is discussed with reference to the literature on the sensitivity and specificity of the classic signs and symptoms of aortic dissection. A combination of the aortic dissection detection risk score (ADD-RS) and D-dimer test is helpful in ruling out this frequently lethal condition.

Introduction

Aortic dissection (AD) is an uncommon but potentially fatal condition. In the undergraduate medical curriculum as well as the postgraduate primary care curriculum, this condition is frequently emphasised as a differential diagnosis to be considered in patients presenting with chest pain. Its classic clinical features include sudden onset, tearing upper back pain, pulse or blood pressure differentials between bilateral limbs, and a widened mediastinum on chest X-ray. However, recent literature indicates that patients more often describe the pain of aortic dissection (AD) as severe and sharp or knife-like (68%) rather than with the classic description of tearing or ripping pain (50%).1,2 This case report describes an atypical presentation of aortic dissection in which a patient presented with sharp, pleuritic, central chest pain, which was associated with a fever and significant C-reactive protein (CRP) elevation.

Case

A 63-year old gentleman presented to our primary care clinic with a two-day history of sudden-onset central chest pain at rest which radiated up to his neck. It was sharp in nature and worse on inspiration. He felt feverish but had neither a cough nor dyspnoea. His pain had been constant, with a score of 7 out of 10. Paracetamol relieved his fever but not the pain. There was no haemoptysis, calf pain, history of immobility, or trauma to his chest. He was on perindopril for hypertension and atorvastatin for dyslipidaemia. He quit smoking seven years ago and did not use any recreational drugs.

Clinically, he looked well and was not tachypnoeic. His oral temperature was 38.3°C, oxygen saturation was 97% on air, respiratory rate was 14 breaths per minute, blood pressure was 135/78 mmHg, and pulse was regular at 95 beats per minute, with no radio-radial delay. On auscultation, his heart sounds were normal. There were equal vesicular breath sounds in the bilateral lung fields. There was no calf swelling or tenderness bilaterally. Examination of other systems, including neurological examinations, were normal.

His electrocardiogram (ECG) did not show any abnormality. A chest X-ray was performed, and it showed no significant abnormality (Figure 1). The following blood tests were ordered: full blood count (FBC), C-reactive protein (CRP), renal profile (RP), liver function tests (LFT), and Troponin T (Trop T).

At this point in time, the differential diagnosis considered was early atypical pneumonia given the pleuritic nature of the pain and fever. An atypical presentation of acute coronary syndrome (ACS) was also considered in view of his cardiovascular risk factors.
Figure 1. Chest radiograph (PA erect) is normal with no widened mediastinum (normal <7.5cm) or double aortic contour.

He was given paracetamol and kept for observation while waiting for his investigation results. An hour later, the laboratory investigations showed an elevated Trop T of 22 (Normal<14 ng/L), white cell count (WCC) of 13.11 x 10^3 (4.0-10.0 x 10^3/µL), neutrophilia of 10.37 x 10^3 (1.9-8 x 10^3/µL), and a CRP of 112.9 (<5.0 mg/L).

Upon discussion with the cardiologist on duty, the patient was admitted for observation with a plan to repeat an ECG and troponin in six hours. Oral antibiotics with atypical pneumonia coverage were given. Upon review, his symptoms settled, and the repeat ECG and troponin were normal. He was discharged with a course of oral antibiotics, a review appointment in three days, and appropriate safety netting.

He returned to the emergency department two days later with a similar persistent pain, lethargy, and feelings of feverishness. His temperature and other vital signs were normal, and there were right basal crackles on auscultation of his lungs. This time, his ECG (Figure 2) showed non-specific changes (widespread ST elevation on leads I, II, V2-V6; ST depression on leads aVR and V1). Repeat blood tests, including for troponin, and blood cultures were normal except for an elevated CRP (334 mg/L). A transthoracic echocardiogram was performed and showed mild global pericardial effusion with a left ventricular ejection fraction of 48%.

Figure 2. ECG on second presentation shows widespread ST elevation on leads I, II, V2-V6; ST depression on leads aVR and V1.

The working diagnosis at this point was community-acquired pneumonia with acute pericarditis. He was started on intravenous ceftriaxone and oral ibuprofen. His symptoms did not improve after two days of treatment; hence, a CT thorax was performed to investigate further.
The CT thorax showed a dilated ascending aorta with possible dissection. Thus, a CT aortogram was subsequently performed. This aortogram showed a Stanford A ascending AD (Figure 3). He was admitted to intensive care for strict pulse and blood pressure control. The cardiothoracic surgical team repaired the ascending aorta surgically using an open approach, while the descending aorta was managed using a stent-graft. The patient recovered well post-operatively and was discharged after five days. He was reviewed in the outpatient clinic after 6 months and has continued to do well.

Discussion

This case demonstrated the diagnostic challenges often faced by frontline doctors when dealing with atypical chest pain. In all cases of chest pain, a bilateral pulse or blood pressure differential can be useful signs to rule in thoracic AD when they are present, with a specificity of 99% (95% CI= 96-100%). However, with a low sensitivity of 38% (95% CI= 30-47%), these are less useful signs to rule out AD when they are absent. Neurological deficit and hypotension are two other examination findings that have a high specificities of 95% (95% CIs of 93-97% and 93-96%, respectively). However, both have very low sensitivities of 18% (95% CI= 11-30%) and 15% (95% CI= 10-23%), respectively. The presence of any of these three features increases the likelihood of AD. However, there was no radio-radial delay, hypotension, or neurological deficit in this patient, and their absence could not exclude the diagnosis.

In this case, atypical pneumonia with acute pericarditis was considered to be the most likely diagnosis, as the patient presented with pleuritic chest pain, fever, and an elevated CRP level. A review of the literature shows that fever is a common accompanying feature for AD and that it has been found in one-third of all patients with AD. The characteristic fever in AD is distinct from that with an infective aetiology. It has been reported that the fever, which is secondary to AD, is seen mostly in type B dissections and that it begins between 48 to 72 hours after the dissection occurs. The variability in body temperature is significantly less when compared with a fever that is secondary to an infection. This retrospective study also showed that in patients with a fever that is secondary to AD, microbiological investigations produced negative results.

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As he was not responding to treatment, another possible differential diagnosis that should have been considered at this stage was pulmonary embolism (PE). His calculated Wells score would have put him into the “PE unlikely” group, necessitating a D-dimer test as the next step in the investigation. In this case, the D-dimer test was likely to have been positive. Therefore, referral for CT angiography would have been the next recommended course of action and would have shown the dissection.

Elevated D-dimer (≥500 ng/mL) has also been found to be highly sensitive (96.7% sensitivity, 95% CI= 93.6-98.6%) for AD but is inadequate as a stand-alone test. The European Society of Cardiology recommends utilizing the Aortic Dissection Detection Risk Score (ADD-RS) and performing the D-dimer test as a secondary filter when the ADD-RS score is ≤ 1. The ADD-RS is a pre-test probability assessment tool that can help
with AD risk stratification. It incorporates the presence of high risk conditions, pain, and examination features. The score represents the total number of groups out of three (see Figure 4 for group details) with the presence of any single risk factor. An ADD-RS score of >1 necessitates referral for a CT Angiography. A recent multicentre prospective study examined the diagnostic accuracy of utilizing the combination of the ADD-RS and the D-dimer test for detection of AD. This study concluded that an ADD-RS score ≤1 plus a negative D-dimer had a sensitivity of 98.8% (95% CI= 96.4-99.7%), negative predictive value of 99.7% (95% CI= 99.1-99.9%), and negative likelihood ratio of 0.02 (95% CI= 0.01-0.07). Therefore, this combination is useful in ruling out AD (Figure 4). This new clinical strategy, which combines a pre-test probability assessment tool, ADD-RS, with the D-dimer test, supports doctors in terms of reducing misdiagnoses and over-testing for AD. However, further validation studies in the primary care setting should be done before integrating this tool into clinical practice.

**Figure 4:** Flowchart for AD evaluation incorporating the ADD-RS and the D-dimer test.
Summary

AD should be considered in all patients with atypical chest pain. It may present with fever and elevated CRP. Pulse or blood pressure differentials, hypotension, and neurologic deficits can be helpful in terms of suggesting aortic dissection, but their absence cannot rule out the diagnosis. The ADD-RS is a useful risk stratification tool for AD, and the combination of the ADD-RS and the D-dimer test is helpful in ruling out AD. However, the D-dimer test is not widely available in the Malaysian primary care setting. Therefore, patients with an ADD-RS score ≤ 1 should be referred for D-dimer testing in the secondary care setting.

“We declare that there are no competing interests and that no funding was received for this case study.

Acknowledgement

We would like to acknowledge Prof. Dr. Mohd Zaki Salleh for his valuable input into this case report.”

How does this paper make a difference to general practice?

• The unusual presentation highlights the need for a heightened level of clinical suspicion of AD in the absence of classic features.
• It highlights that:
  o fever and elevated CRP are possible associated features of AD.
  o the absence of classic features, such as pulse or blood pressure differentials, hypotension, and neurological deficits, does not rule out AD due the low sensitivity exhibited by these features.
  o the ADD-RS is a useful tool for AD risk stratification.
  o the combination of the ADD-RS and the D-dimer test is useful in ruling out AD.

References


A rare catastrophic cause of muffled voice
Mohamad I, Saniasaya J, Nadarajah S, Salmah WM

Case summary
A 60-year-old diabetic lady presented with a four-day history of sore throat and fever, followed by dysphagia, odynophagia and voice change. It started with a low-grade fever with no chills or rigor, no night sweats and no loss of weight or appetite. There was no other positive history.

Upon examination, she had a muffled voice. There was no audible stridor. The oral and oropharyngeal examinations were normal. A lateral neck radiograph was obtained (Figure 1).

**Figure 1**

**Questions**
1. Describe the abnormalities.
2. What is the most likely diagnosis?
3. What is the next management step?

**Answers**
1. The lateral neck radiograph revealed a widening of the pre-vertebral soft tissue. In a lateral cervical radiograph, at C4 and downwards, when the width of the pre-vertebral soft tissue exceeds that of the vertebra body, the pre-vertebral soft tissue is said to be widened. Above the C4 level, pre-vertebral soft tissue of more than 1/3 the vertebra body width is considered pathological. In this patient, there was loss of the normal cervical lordosis. (The red line represents an estimated width similar to the vertebral body width).

2. Based on the radiological features, a retropharyngeal infection is the most likely cause of the muffled voice. Risk factors include foreign body ingestion, trauma to the posterior pharyngeal wall, infection to the pharynx or neck spaces, dental caries and being diabetic. Sequela of this condition can lead to abscess formation. The muffled voice, also known as hot potato voice, is pathognomonic of quinsy. It indicates a space-occupying lesion in the oral cavity or oropharynx. Having enlarged tonsils due to acute tonsillitis, tonsillar hypertrophy or tumor can produce similar symptoms.1 Larynx or pharyngeal lesions produce the symptoms rarely; however, they still need to be ruled out, especially when the oral and oropharyngeal examinations are normal. Acute epiglottitis, supraglottitis or any space-occupying lesion collection in the retropharyngeal space can produce similar symptoms, although occurrences are rare in adults.2 Muffled voice is a sign of a narrowed upper airway.
The patient should be referred urgently to an otolaryngologist for an endoscopic evaluation of the airway. In this case, the laryngoscopy revealed fullness over the left lateral and posterior pharyngeal wall, along with slough over the left pyriform sinus. Apart from that, other examinations and laboratory parameters were normal, with the exception of mild leucocytosis.

3. In the light of patient’s history and clinical examination, a preliminary diagnosis of a retropharyngeal abscess was made. The patient was admitted and immediately started on intravenous Cefuroxime 750mg TDS and intravenous Metronidazole 500mg TDS. The patient was kept at nil by mouth. An urgent CT scan showed evidence of cellulitis changes in the retropharyngeal space (Figure 2). A CT scan is more sensitive but less specific than a lateral soft tissue neck radiograph.3 However, it is invaluable in assessing the nature of an infection (cellulitis or abscess), the extent of an infection and its lethal complications. For example, a posterior extension can lead to discitis osteomyelitis, an epidural abscess, and a lateral extension can involve great vessels (carotid artery hemorrhage, carotid aneurysm and jugular vein thrombosis).

An inferior extension can lead to mediastinitis. Thus, clinical correlation and monitoring of progress is very important in the management of such a case. The patient must be kept in the ward for observation.

On the following day, as the patient showed improvement, we opted to continue the medical treatment while keeping in mind that an incision and drainage would have to performed should her symptoms worsen. Over the next three days, the patient improved tremendously with regards to her voice and oral intake. Her white count normalized, and there was no fever. A serial neck radiography revealed improvement in the condition.

In conclusion, muffled voice in the absence of intraoral or oropharyngeal lesions, for example, quinsy or tonsillar hypertrophy, should alert the primary physician to the possibility of the presence of a space-occupying lesion in the lower part of the upper aerodigestive tract. It can be the result of a swollen epiglottis (acute epiglottitis) or any narrowing of the pharynx. The sign indicates impending airway obstruction and equipment for intubation must be at hand.

Figure 2. (A) Plain and (B) contrasted CT scan of the neck showing widened pre-vertebral soft tissue space with minimal contrast enhancement. There was no extension into the mediastinum (not shown).
References


