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- Effectiveness of a brief intervention for smoking cessation using the 5A model with self-help materials and using self-help materials alone: A randomised controlled trial
- Prevalence and characteristics of e-cigarette users among Malaysian current and ex-smokers
- Mental Health Status and Its Associated Factors Among Caregivers of Psychiatric Patients in Kuching, Sarawak



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The Malaysian Family Physician Journal

Academy of Family Physicians of Malaysia,

Unit 1-5, Level 1 Enterprise 3B Technology Park Malaysia (TPM)

Jalan Innovasi 1 Lebuhraya Puchong-Sungai Besi

Bukit Jalil, 57000 Kuala Lumpur.

Tel: +603 4041 6800 / 4041 7800

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- Books and other monographs: Personal Author(s) Stewart M, Brown JB, Weston WW, et al. Patient-Centered Medicine: Transforming the Clinical Method. Thousand Oaks, California: Sage Publications; 1995.
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Changing needs of future patients: How do healthcare delivery adapt?

Lee PY

Deputy Chief Editor

Dear readers,

In this issue of our journal, two articles have brought our attention to the changing needs of our future patients. Utap MS et al. reported no significant difference between a brief intervention using the '5A' model with self-help materials and using self-help materials alone for smoking cessation in a Malaysian primary care setting.¹ This has highlighted that patients are more empowered for self management with no additional benefits being observed for advice and counselling from healthcare providers. In another article, Ho BK et al. found that e-cigarette users were more likely to be at younger age group among Malaysian.² This may be a new area of health issue to be handled by healthcare providers. Therefore, our future healthcare delivery will need to be redesigned to adapt to the needs of younger generation. Preventive care will become the mainstream of health care. The younger generation who are digital native will expect tailored, individualized care of their health and are empowered to engaged in their own health and healthcare delivery with the use of technology and social media. This generation will have a consumer mindset rather than patient mindset. They desire access to care and expect more transparency as they are extremely cost conscious. Instead of the current usual paternalistic approach, this generation expect collaborative decision-making with healthcare provider.³⁻⁴ Healthcare providers need to adapt to this shift of care delivery approach in the very near future. In addition, medical schools will also need to make the necessary adaptation to educate future generations of doctors.³⁻⁴

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Effectiveness of a brief intervention for smoking cessation using the 5A model with self-help materials and using self-help materials alone: A randomised controlled trial

Utap MS, Tan CPL, Su AT

Utap MS, Tan CPL, Su AT. Effectiveness of a brief intervention for smoking cessation using the 5A model with self-help materials and using self-help materials alone: A randomised controlled trial. *Malays Fam Physician*. 2019;14(2);2–9.

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Authors:

Maurice Steve Utap

(Corresponding author)

MBBS (UM), Master in Family

Medicine (UM)

Tudan Health Clinic, Miri Divisional

Health Office, 98100 Miri, Sarawak

Malaysia.

Email: mauriceutap76@yahoo.com

Christina Phoay Lay Tan

PhD, MPhil (HealthScEd), FRCGP,

MRCGP, MBBS

Department of Primary Care

Medicine, University of Malaya

50603 Kuala Lumpur, Malaysia.

Email: tanpl@ummc.edu.my

Anselm Su Ting

MBBS, MPH, MPH (Occupational

Health), MFOM (Ireland)

Community Medicine and Public

Health Department, University

Malaysia Sarawak, 94300 Kota

Samarahan, Sarawak

Malaysia.

Email: anselmsuting@yahoo.com

Abstract

Introduction: The ‘5A’ model for smoking cessation was introduced in 2000 by the US Department of Health and Services. This brief intervention was recommended worldwide for smoking cessation. However, little is known about its effectiveness for smoking cessation in a primary care setting in Malaysia.

Objective: To determine the effectiveness of a brief intervention for smoking cessation using the ‘5A’ model with self-help materials compared to using self-help materials alone.

Methods: This randomised controlled trial was conducted at the Primary Care Clinic at the University Malaya Medical Centre (UMMC) between June and October 2009. Subjects were all current smokers aged 18 years and above. A total of 208 subjects were recruited and randomised into two groups. Subjects in the intervention group were given a brief intervention based on the ‘5A’ model with self-help materials, while the control group received self-help materials alone. Subjects were later followed up at one and four months via telephone calls. The outcome measure was a self-reported attempt to quit smoking.

Results: At one-month follow-up, 15/77 (19.5%) of the participants in the intervention group had attempted to quit smoking compared to 8/80 (10.0%) in the control group. There was no significant difference between the two groups ($p=0.09$). At the four-month follow-up, 13/58 (22.4%) participants in the intervention group had attempted to quit smoking compared to 9/57 (15.8%) in the control group. Once more, there was no significant difference between the two groups ($p=0.37$).

Conclusion: This study showed that there was no significant difference between a brief intervention using the ‘5A’ model with self-help materials and using self-help materials alone for smoking cessation in a Malaysian primary care setting. However, these results do need to be treated with caution when taking into consideration the high dropout rate and bias in the study design.

Introduction

Tobacco smoking remains the biggest preventable cause of morbidity and mortality.¹ It is a well-known risk factor for developing cardiovascular diseases, chronic obstructive pulmonary disorders, and cancers of the lung, oral cavity, larynx, oesophagus, stomach, pancreas, colorectum, bladder, and kidney.^{1,2} Mackay reported in 2001 that one in three adults worldwide (1.1 billion people) were smokers.³ In 2009, the Tobacco Atlas highlighted the loss of a staggering 500 billion US dollars annually due to tobacco use.⁴ These economic costs come as a result of lost productivity, misused resources, missed opportunities for taxation, and premature death. In Malaysia, the overall prevalence of current smokers aged 15 years old and above was 22.8% in 2015, with 43.0% of males being smokers and 1.4% of females.⁵

There is clear evidence that simple advice from a physician has little effect on cessation rates.⁶ Assuming an unassisted rate for quitting smoking of 2 to 3%, an intervention in the form of brief advice can increase the rate by a further 1 to 3%. Additional components appear to have only a small effect, although there is a small additional benefit of more intensive interventions over very brief interventions. Standard self-help materials may increase rates of quitting over no intervention, but the effect is likely to be small.^{7,8} Alternative therapies, such as hypnosis, acupuncture, acupressure, laser therapy, and electrostimulation, have no scientifically proven effects.^{9,10} A systematic review by Lemmens et al. found evidence of effectiveness for the following strategies (in decreasing order of effectiveness): group behavioural therapy

(odds ratio (OR): 2.17, confidence interval (CI): 1.37-3.45), bupropion (OR: 2.06, CI: 1.77-2.40), intensive advice from a physician (OR: 2.04, CI: 1.71-2.43), nicotine replacement therapy (OR: 1.77, CI: 1.66-1.88), individual counselling (OR: 1.56, CI: 1.32-1.77), telephone counselling (OR: 1.56, CI: 1.38-1.77), nursing intervention (OR: 1.47, CI: 1.29-1.67), and tailored self-help interventions (OR: 1.42, CI: 1.26-1.61).¹¹ In Malaysia, Wee et al. found that older age and longer durations of prior attempts to quit smoking were predictors of successful smoking cessation.¹²

A study in Chile using a brief intervention based on the '5A' model showed that 15.2% of women reported quitting smoking for at least 1 month in the intervention clinic versus 7.8% in one of the control clinics.¹³ When using the '5A' model, health care providers should follow a 5-step process: (i) *Ask* every patient about tobacco use, (ii) *Advise* smokers to quit, (iii) *Assess* smokers' willingness to attempt to quit, (iv) *Assist* smokers who are willing to make an attempt to quit, and (v) *Arrange* for follow-up contact to prevent relapse.¹⁴⁻¹⁷

In Pbert et al.'s study,¹⁸ the '5A' model recommended by the US Public Health Service Clinical Practice Guideline was used on adolescents aged 13 to 17 years. It showed that the adolescents who received the provider- and peer-delivered intervention were more likely to report having quit smoking at the six-month, but not the 12-month, follow-up. Further, Pbert et al., in another study, concluded that a four-session smoking cessation intervention based on the '5A' model could feasibly be delivered by school nurses and increase self-reported short-term abstinence rates among the students interested in quitting smoking.¹⁹ However, in comparison, Unrod et al. found that a computer-based, tailored intervention built on the '5A' model demonstrated that intervention patients were more likely than controls to be abstinent, but the difference did not reach statistical significance at six months post-intervention.²⁰

The aim of this study was to determine the effectiveness of this intervention in an urban population at the primary care level in Malaysia. The findings from this study should help to provide evidence as to whether the '5A' model could be used as an effective smoking cessation programme in the Malaysian primary care setting.

Methods

This study used a randomised controlled trial. The enrolment period was from 1 June 2009 till 30 June 2009. The subjects were recruited from the Primary Care Clinic at the University Malaya Medical Centre, which provides outpatient care to the public from the cities of Kuala Lumpur and Petaling Jaya and the surrounding urban areas. The inclusion criteria for the study were that the subjects were aged 18 years and above and current smokers. The exclusion criteria were smokers presently receiving pharmacological treatment for smoking cessation at the time of the study, those with psychiatric illnesses, and those who were pregnant. Subjects who fulfilled the inclusion criteria were approached by the principal investigator as they registered at the clinic, and those who agreed to participate in the study were randomly allocated to one of two groups via a random number table.²¹ Following the number sequence, subjects who received odd numbers were put into the control group, while those received even numbers were assigned to the intervention group. After this random allocation, each subject completed a questionnaire and then had a face-to-face interview with the principal investigator based on the questionnaire. The questionnaire included socio-demographic data, smoking cessation behaviour, and the six-item Fagerström test of nicotine dependence (FTND) scale.^{22, 23}

Subjects in the intervention group were given a brief intervention based on the '5A' model and self-help materials by the same investigator. This brief intervention included the following:

5A	Providing a Brief Smoking Cessation Intervention	Time
Ask	Ask about duration of tobacco use, amount and type of tobacco use.	1 min.
Advice	Advise all smokers to quit in a clear, strong, and personalized manner. Clear: "I think it is important for you to quit smoking now and I can help you." "Cutting down while you are ill is not enough" Strong: "As your doctor, I need you to know that quitting smoking is the most important thing you can do to protect your health now and in the future. The clinic staff and I will help you." Personalised: Tie tobacco smoking to current health/illness and/or its social and economic costs, motivational level/readiness to quit, and/or the impact of tobacco smoking on children and others in the household.	30 sec.
Assess	Assess the subject's willingness to quit smoking using the Prochaska Stages of Change model. ²¹ Pre-contemplation: Provide motivational intervention or discontinue. Contemplation: Provide motivational intervention and information. Preparation: Provide assistance. Action & Maintenance: Congratulate and encourage the subject	30 sec.
Assist	Assist the subject with a plan for quitting and set a quit date. Tell family, friends, and co-workers about quitting and request understanding and support. Provide self-help materials and explain (tips to quit smoking, list of clinics for quitting smoking, problem-solving strategies).	3-5 min.
Arrange	Arrange follow-up in one month after the quit date either in person or via telephone. Subsequent follow-up in four months. If the subject has quit smoking, congratulate him/her on his/her success. If tobacco smoking has occurred, review circumstances and elicit recommitment to total abstinence. Remind smoker that a lapse can be used as a learning experience. Identify problems already encountered and anticipate challenges in the immediate future. Consider using more intensive treatment; if not available, referral is indicated.	5 min.

Adapted from the Malaysian Clinical Practice Guideline on Treatment of Tobacco Smoking and Dependence (2016)¹⁵ and Quit smoking. You too can help! A guide for dental practitioners (2008).¹⁶

The control group was given self-help materials only without explanation. The self-help materials included information on such topics as the harmfulness of smoking, benefits of quitting smoking, tips on quitting smoking, and a contact telephone number for clinics for quitting smoking under the Ministry of Health in Malaysia. These self-help materials were used as the control because the principal investigator thought that this method would help to facilitate the recruitment of the subjects into this study.

Subjects were followed up at one and four months from the time of enrolment via telephone calls and were asked about their attempt to quit smoking. Those who did not answer the telephone during three consecutive attempts (all 1 hour apart) to reach them on the same day were considered drop-outs.

This study was approved by the University Malaya Medical Centre (UMMC) Medical Ethics Committee (Reference Number 709.5).

Statistical analysis

For the sample size calculation with 95% confidence, a simple formula for calculating the sample size is given by $\text{Size per group} = c \times \frac{\pi_1(1 - \pi_1) + \pi_2(1 - \pi_2)}{(\pi_1 - \pi_2)^2}$, where $c = 7.9$ for 80% power (used in this study) and 10.5 for 90% power, and π_1 and π_2 are the proportion estimates.²⁴

For this study, $\pi_1 = 0.078$ (7.8%) and $\pi_2 = 0.228$ (22.8%), so $\text{Size} = 7.9 \times \frac{(0.078(1-0.078) + 0.228(1-0.228))}{(0.078-0.228)^2} = 87$ (each group) $\times 20\% + 87 = 104$ (each group)

Data entry and analyses were done using the Statistical Package for the Social Sciences (SPSS) Version 15.0 for Windows. Results were presented in a frequency table with means and standard deviations for numerical data and absolute numbers and percentages for categorical data. The student t-test was used to compare the means (control and intervention) of numerical variables, such as age, the

number of cigarettes smoked per day and number of years smoking. While cross tabulation using the Chi-square test was used to test for relationships between the categorical variables, such as sex, ethnic group, marital status, education level, income level, age started smoking, types of cigarettes smoked, and attempts to quit smoking at the one- and four-month follow-ups. Per protocol, the last two tests were used to provide an estimate of the true efficacy of the intervention. The level of significance for all tests was set at 0.05.

Results

A total of 208 subjects were recruited for this study. One-hundred and four subjects were randomised into each of the intervention and control groups (Figure 1).

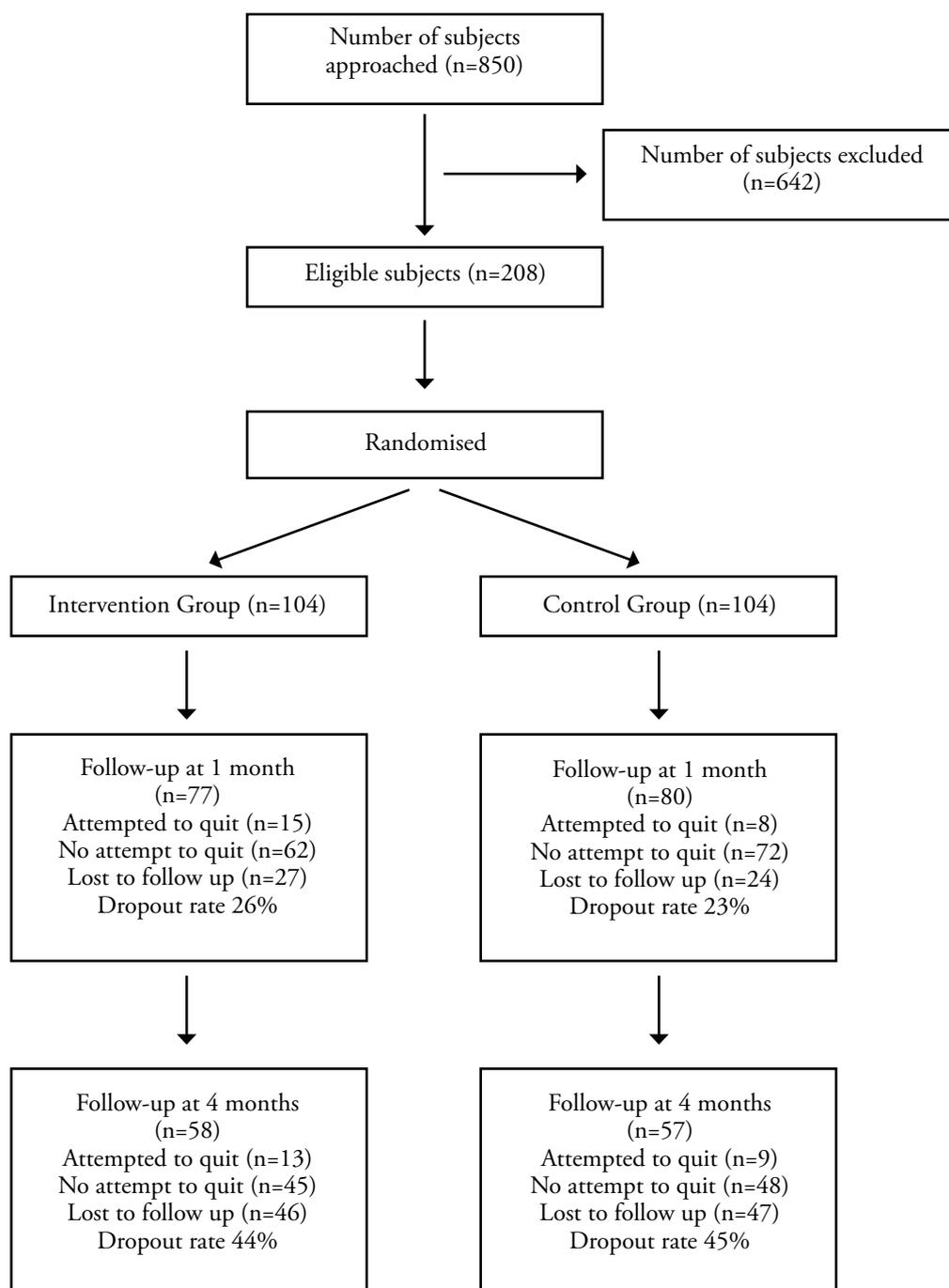


Figure 1. Consolidated Standards of Reporting Trials (CONSORT) flow diagram of the progress of the participants through the study.

A comparison of the socio-demographic characteristics of the intervention and control groups is shown in Table 1.

Table 1. Socio-demographic characteristics of the subjects by group (n=208)

	Intervention Group (n=104)	Control Group (n=104)	p value
Age (years), mean \pm SD	40.09 \pm 14.28	39.94 \pm 14.14	0.94
<i>Sex, n (%)</i>			
Male	97(93.3)	97(93.3)	1.00
Female	7(6.7)	7(6.7)	
<i>Ethnic Group, n (%)</i>			
Malay	53(51.0)	58(55.8)	0.12
Chinese	12(11.5)	15(14.4)	
Indian	29(27.9)	29(27.9)	
Other	10(9.6)	2(1.9)	
<i>Marital Status, n (%)</i>			
Single	35(33.7)	35(33.7)	0.25
Married	68(65.4)	64(61.5)	
Other	1(1.0)	5(4.8)	
<i>Education Level, n (%)</i>			
Primary	13(12.5)	13(12.5)	0.95
Secondary	65(62.5)	63(60.6)	
Tertiary	26(25.0)	28(26.9)	
<i>Income Level, n (%)</i>			
<RM 500	14(13.5)	11(10.6)	0.71
500-999	18(17.3)	18(17.3)	
1000-1999	39(37.5)	31(29.8)	
2000-2999	21(20.2)	27(26.0)	
3000-3999	6(5.8)	9(8.7)	
4000-4999	2(1.9)	1(1.0)	
>5000	4(3.8)	7(6.7)	

Comparison of the smoking characteristics of the subjects showed no significant differences between the intervention and control groups, and this information is summarised in Table 2.

Table 2. Smoking Characteristics by Group (n=208)

	Intervention Group (n=104)	Control Group (n=104)	p value
No. of cigarette smoked per day, mean \pm SD	12.53 \pm 7.06	12.43 \pm 7.52	0.92
No. of years smoking, mean \pm SD	20.92 \pm 13.10	19.48 \pm 12.51	0.42
<i>Age started smoking, n (%)</i>			
4-12yr	6(5.8)	6(5.8)	0.32
13-17	32(30.8)	38(36.5)	
18-25	52(50.0)	39(37.5)	
26-35	13(12.5)	17(16.3)	
36-46	1(1.0)	4(3.8)	
<i>Types of cigarettes, n (%) #</i>			
Filtered	102(93.6)	100(90.1)	0.41
Non-filtered	2(1.8)	4(3.6)	0.41
Cigar	1(0.9)	0(0)	0.32
Tobacco leaf	4(3.7)	7(6.3)	0.40

Multiple responses per individual possible. The intervention group had 109 responses, and the control group had 111 responses.

The attempts to quit smoking recorded at the one- and four-month follow-ups are shown in Table 3.

Of the subjects available for follow-up at one month, 19.5% (n=15) in the intervention group had attempted to quit smoking, while 10.0% (n=8) had attempted to quit smoking in the control group (p= 0.09).

At the four-month follow-up, 22.4% (n=13) had attempted to quit smoking in the intervention group, while 15.8% (n=9) had attempted to quit smoking in the control group (p= 0.37).

Table 3. Quit smoking attempts at the one- and four-month follow ups

	Intervention Group	Control Group	p value
<i>Attempt to quit smoking at 1 month, n (%)</i>			
Yes	15(19.5)	8(10.0)	0.09
No	62(80.5)	72(90.0)	
<i>Attempt to quit smoking at 4 months, n(%)</i>			
Yes	13(22.4)	9(15.8)	0.37
No	45(77.6)	48(84.2)	

Discussion

Some of the socio-demographic characteristics of the subjects in this study were comparable to the findings in previous local studies.^{5,12,25} In particular, almost all subjects were male, and there were fewer Chinese than smokers from other major races. More than 85% of subjects had at least a secondary or tertiary education. The subjects started smoking predominantly in their teens and young-adult years, and the number of cigarettes smoked per day was, on average, 12.5.

The objective of this study was to determine the effectiveness of a brief intervention based on the '5A' model and providing self-help material compared with providing self-help material alone for smoking cessation at a primary care clinic. This study showed that there was no significant difference between the intervention group and the control group for smoking cessation at the one- and four-month follow-ups (**Table 3**). Although there was no statistically significant difference in the rate for quitting smoking between the two groups, there were a substantial number of smokers who had attempted to quit smoking by the one-month and four-month follow-ups in the intervention group.

Wee et al.'s review of smoking research in Malaysia has drawn attention to the limited number of local studies on intervention strategies to curb smoking and, in particular, non-pharmacological intervention strategies.²⁵ Therefore, there is a need for more local clinical trials in this area.

The 2014 Cochrane Database of Systematic Reviews found that standard, print-based self-help materials increased rates of quitting compared to no intervention, but the effect is likely to be small.²⁶ The authors failed to find evidence that the self-help materials provided an additional benefit when used alongside other interventions, such as advice from health care professionals or nicotine-replacement therapy. However, there was evidence that materials that are tailored to individual smokers are more effective than non-tailored materials, although the absolute size of the effect is still small. The findings from this study were consistent with the conclusion from the Cochrane Database Systematic Review with regard to the lack of additional benefits when self-help materials are used alongside other interventions, such as brief advice using the '5A' model.

There are some limitations to this study. The first limitation concerns investigator bias in view of the fact that study was not blinded. A second limitation emerges from the use of even or odd numbers for randomization since selection bias could be present if the subjects happened to enter the clinic in a particular pattern. In this study, however, this limitation was trivial because there was no particular pattern of entry into the study. This point is further enforced by the heterogeneous distributions of the different characteristics of the study subjects. The third limitation is the response bias in self-reporting attempts to quit smoking. This bias could be reduced by using exhaled carbon monoxide measurements or urinary cotinine levels. However, neither method was used in this study due to non-availability of such facilities in which

to conduct these measurements at the time the study was conducted. The fourth limitation is that there were many subjects who were lost to follow-up at the one-month and four-month follow-up intervals in this study. The dropout rate was high in the follow-up period and nearly identical for both groups, as indicated by the 26% drop-out rate for the intervention group and the 23% drop-out rate for the control group at the one-month follow-up, and then 44% and 45% drop-out rates for the respective groups at the four-month follow-up session. The results do need to be treated with caution by taking into account the high dropout rates and the bias in the study design. The majority of the subjects cited stress and peer pressure (64.5 % in the intervention group, and 62.8% in the control group) as the two main reasons for relapse, while one-fifth cited reasons for relapse related to withdrawal symptoms, such as craving (23.6% in the intervention group, and 21.7% in the control group). One suggestion for improving the study design for the future is to have another control group without any intervention, which is the usual case for comparison, to be absolutely sure that the effect on quitting smoking was due to the '5A' model using self-help materials or self-help materials alone and not purely by chance. Although some reasons for the high dropout rate in both groups in this study were provided, it might be worth exploring this issue further in a future qualitative study to gain additional insights into the challenges faced by smokers in quitting smoking.

This study showed that a brief intervention based on the '5A' model and providing self-help

material was not more effective than using self-help material alone for smoking cessation in the primary care clinic. One implication from this study for clinical practice is that clinicians can use either of these methods to help people to quit smoking, as no one method is superior to the other. The choice of which method to use will depend on the time available providing help because the brief intervention based on '5A' model is much more time consuming (10 to 12 minutes) compared to just providing the self-help materials to smokers who want to quit.

Conclusion

This study showed that there was no significant difference between a brief intervention based on the '5A' model and providing self-help materials and using self-help materials alone for smoking cessation in a primary care setting. However, these results do need to be treated with caution when considering the high dropout rates and bias in the study design.

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Conflict of interest

None

How does this paper make a difference to general practice?

- Clinicians can use a brief intervention based on the '5A' model and providing self-help materials or using self-help materials alone to help people to quit smoking, as no one method is superior to the other.
- The choice of method will depend on the time available because the brief intervention based on the '5A' model takes more time (10 to 12 minutes) compared to just providing the self-help materials to smokers who want to quit.

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Prevalence and characteristics of e-cigarette users among Malaysian current and ex-smokers

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Authors:

Ho Bee Kiau

(Corresponding author)

MBBS, M Fam Med

Bandar Botanic Health Center, Blok

A, Jalan Langat, Bandar Botanic

41200 Klang, Selangor Darul

Ehsan, Malaysia.

Email: bkho@hotmail.com

Mohamad Haniki b. Nik Mohamed

B.Pharm(Hons), PharmD(TN, USA)

International Islamic University

Malaysia, Kuantan, Malaysia.

Email:haniki@iiu.edu.my

Jamalludin Ab Rahman

MD, MPH

International Islamic University

Malaysia, Kuantan, Malaysia.

Email: arjamal@iiu.edu.my

Samsul Draman

MD, M Fam Med

International Islamic University

Malaysia, Kuantan, Malaysia.

Email: nurin@iiu.edu.my

Mira Kartiwi

B.Com, PhD(InfoSys)

International Islamic University

Malaysia, Gombak, Malaysia.

Email: mira@iiu.edu.my

Abstract

Introduction: Electronic cigarettes (ECs) are new devices that have been accepted widely by both smokers and non-smokers. However, the evidence on EC used in Malaysia is scarce. The objective of this study was to determine the prevalence of EC use and the socio-demographic and smoking characteristics associated with current EC use among Malaysian current and ex-smokers.

Methods: This was a sub-analysis of data from a cross-sectional, national-population-based EC study conducted from May to June in 2016 in Malaysia. A detailed description of the sampling methods can be found in the National E-cigarette Survey (NECS) 2016 report. Briefly, data were obtained from 1396 individuals who had ever been smokers, i.e., 957 (68.6%) current smokers and 439 (31.4%) ex-smokers.

Results: Current EC use was found predominantly among current smokers (8.0%) as compared with ex-smokers (4.3%). Among current smokers, the main reasons given for smoking ECs were wanting to try it (44.7%), followed by intention to quit tobacco smoking (15.8%) and to reduce tobacco smoking (10.5%). Using multiple logistic regression analysis, we found that among current smokers, current EC users were more likely to be younger, i.e., 18–44 years (aOR= 4.83, 95% CI= 1.97–11.86, p=0.001), urban residents (aOR= 1.89, 95% CI= 1.15–3.11, p=0.012), single/ divorced/ widowed (aOR= 2.11, 95% CI= 1.24–3.61, p=0.006) and students (aOR= 2.25, 95% CI= 1.01–5.01, p=0.048). Among ex-smokers, only younger respondents (18–44 years old) was reported as being more likely to be current EC users (aOR= 3.81, 95% CI= 1.14–12.76, p=0.030).

Conclusion: This study showed that currently using and ever having used ECs were more prevalent among current smokers. The reasons given for initiating EC use among current smokers were mainly wanting to try it, followed by intention to quit and to reduce tobacco smoking. Current EC use appears to be common among current smokers who are younger, urban residents, single/divorced/widowed and students. Therefore, EC cessation intervention strategies and policies should target these high-prevalence groups.

Introduction

Smoking is one of the leading causes of preventable death worldwide and is considered to be a serious public health problem.¹ It is an important risk factor for disability and premature death.² Annually, tobacco use kills an estimated 6 million people worldwide, and 600,000 of these deaths were those of non-smokers who were exposed to second-hand smoke.³

The overall prevalence of current smokers has reduced slightly from 23.1% in 2011 to 22.8% in 2015. However, the prevalence of smokeless tobacco products, which includes electronic cigarettes (ECs), has increased markedly from 0.7% in 2011 to 10.9% in 2015.⁴ The Global Adult Tobacco Survey 2011 (GATS) showed that among those who have ever smoked on a daily basis, only 9.5% have quit successfully.⁵

ECs are new devices, introduced as smoking cessation aids, that have been widely accepted

by smokers and non-smokers. ECs are battery-powered devices that provide nicotine to the user by heating a nicotine solution and transforming it into vapour.^{6,7} Studies have raised health concerns related to EC use, as potentially harmful ingredients have been identified in some e-cigarette solutions.^{6,8,9} However, recent randomised controlled trials have showed that EC use may assist smokers in smoking cessation.¹⁰ Considering the difficulties involved in quitting smoking tobacco, ECs are of great interest to smokers, perhaps offering a way to quit.

One recent population survey in the U.S. found that about 11% of current smokers and 2% of former smokers had used ECs and also that well-educated smokers were more likely to be EC users.¹¹ As is the case in Malaysia, data is limited in terms of the extent and characteristics of EC use among smokers and ex-smokers. Hence, the objective of this study was to determine the prevalence of EC use and the socio-demographic and smoking characteristics associated with

Syafinaz Ab Rahman

B.Pharm(Hons), PhD(Pharmacy Practice)
International Islamic University
Malaysia, Kuantan, Malaysia.
Email: norny@iium.edu.my

Noor Zurani Md Haris Robson

MBBS, PhD(Addiction)
University Malaya Medical Centre,
Kuala Lumpur
Email: noorzurani@um.edu.my

Caryn Mei Hsien Chan

PhD(Psycho-oncology)
National University of Malaysia
Kuala Lumpur, Malaysia.
Email: caryn.cmh@gmail.com

Lim Kuang Hock

BSc Enc Science, MSc Env Science
Institute for Medical Research
Kuala Lumpur, Malaysia.
Email: keelimkota@yahoo.com

Nizam bin Baharom

DrPH
Ministry of Health, Malaysia.
Email: drnizam@yahoo.co.uk

Norliana Ismail

DrPH
Ministry of Health, Malaysia.
Email: norliana.ismail@moh.gov.my

Tee Guat Hiong

BBioMedSc(Hons), MMedSc(Public Health)
Institute for Public Health, Kuala Lumpur
Email: helentee.gh@moh.gov.my

current EC use among current and ex-smokers in Malaysia.

Methods**Study design**

This was a sub-analysis of data from a cross-sectional, national-population- based EC study conducted from May to June 2016 in Malaysia. The methodology was designed to represent all Malaysian adults aged 18 years and above and was based on household populations at the national as well as the urban and rural levels. Approval for the study was obtained from the Medical Research and Ethics Committee of the Ministry of Health Malaysia (NMRR-16-171-28819 (IIR).

Sampling methods

Multistage stratified clustered random sampling was used in this survey, and stratification was done on the state and urban/rural levels. The Primary Sampling Unit (PSU) was the administrative district, and three districts were randomly selected from each state. The Secondary Sampling Units (SSUs) were the Enumeration Blocks (EBs) within the selected districts. The number of EBs selected per state was proportionate to the population size. Living Quarters (LQs) served as the Final Sampling Units. They were defined as separate and independent structures usually used as places for living. On average, an EB consisted of 80 to 120 LQs. Twelve LQs were randomly selected from each selected EB and all eligible respondents in the selected LQs were selected for the study. Eligible respondents included those who had lived in the selected residences for at least 6 months in the past year, were able to understand Bahasa Melayu or English and agreed to participate. Institutional populations, such as those staying in hotels, hostels, hospitals and so forth, were excluded from the study. A detailed description of the sampling methods is provided in the National E-cigarette Survey (NECS) 2016 report.¹²

There were a total of 10,471 adults identified for this survey, but only 3,604 and 3,302 adults were eligible (as per the selection criteria) from the urban and rural areas, respectively. Of these, 3,302 and 2,197, respectively, agreed to participate in the survey, providing response rates of 60% and 67% for the urban and rural areas, respectively. For the purposes of this study, data were obtained from the 1396 adults who had ever smoked, i.e., 957 (68.6%) current smokers and 439 (31.4%) ex-smokers.

Measures

Respondent characteristics gathered included age, sex, residence, education, occupation, ethnicity, religion, marital status, plus status of EC use and tobacco smoking.

The working definitions for EC use in our study were adopted from a National Center for Health Statistics (NCHS) Data Brief.¹³ A current EC smoker was defined as someone who had taken at least a puff of an EC and had been smoking for the last 30 days. Ever an EC smoker was defined as someone who had taken even one puff of an EC.

As for tobacco-smoking status, the working definitions used were adopted from the Centers for Disease Control and Prevention (CDC).¹⁴ Current smokers were defined as respondents who had smoked at least 100 cigarettes in their lifetime and who had smoked at least one cigarette in the past 30 days. Ex-smoker was defined as those who had not smoked for the past 6 months or more.

Analysis

Data was analysed using IBM SPSS statistical software Version 22.0. Differences between current and ex-smokers in socio-demographics, smoking characteristics and the prevalence of EC current use and having ever used were examined with chi-square tests for categorical variables and t-tests for continuous variables. The association of current EC use with sociodemographic characteristics and smoking profiles was assessed using multiple logistic regression. The analyses used current EC user status as the dependent variable. Variables with a p-value of less than 0.25 when tested were selected for inclusion in the multiple logistic regression analysis model.

For current smokers, covariates included for analysis were age group, residence, education, occupation, marital status and age at which they started smoking tobacco. As for the ex-smokers, the covariates included were age group, residence, education and occupation. All statistical analyses were carried out with 95% confidence intervals.

Results

Of the 1396 adults who ever smoked included in this study, 957 (68.6%) were current smokers and 439 (31.4%) were ex-smokers.

Jane Ling Miaw Yn

MBBS
Institute for Public Health,
Kuala Lumpur, Malaysia
Email: jane@moh.gov.my

Lei-Hum Wee

BA(Hons), PhD(MHlth Comm)
National University of Malaysia
Kuala Lumpur, Malaysia.
Email: weeleihum@ukm.edu.my

Table 1 shows the socio-demographic characteristics as well as the smoking and EC use profiles of the participants by smoking status. Current EC use was found predominantly among current smokers (8.0%) compared with ex-smokers (4.3%). Ever using ECs was also significantly higher among current smokers (29.3%) as compared with ex-smokers (14.1%).

Table 2 shows the characteristics of current EC users by smoking status. Among current users of ECs, there were no significant differences between current and ex-smokers in the frequency of EC use, number of EC puffs per session and reasons for starting EC. Among current smokers, the reasons listed for smoking ECs were mainly wanting to try it (44.7%), followed by intentions to quit smoking tobacco (15.8%) and to reduce smoking tobacco (10.5%).

Table 3 shows the characteristics of current EC users by smoking status. Among current smokers, EC use was significantly higher

among younger smokers (18-44 years), urban residents, those who had attained a secondary education and above, students, being single/divorced/widowed and those who started to smoke tobacco at an age of less than 20 years old.

Table 4 shows the outcomes of the multivariate models investigating the demographic associations with current EC use among current smokers and ex-smokers. Among current smokers, we found that current EC users were more likely to be younger smokers, i.e., in the age range 18-44 years (aOR= 4.83, 95% CI= 1.97-11.86, p=0.001), urban residents (aOR= 1.89, 95% CI= 1.15-3.11, p=0.012), single/ divorced/ widowed (aOR= 2.11, 95% CI= 1.24-3.61, p=0.006) and students (aOR= 2.25, 95% CI= 1.01-5.01, p=0.048). Among ex-smokers, only younger respondents (18-44 years old) was reported as being more likely to be current EC users (aOR= 3.81, 95% CI= 1.14-12.76, p=0.030).

Table 1. Socio-demographic characteristics as well as the smoking and EC use profiles of the participants by smoking status (n=1396)

Variables	Current smokers (n=957) n (%)	Ex-smokers (n=439) n (%)	P
<i>EC use status</i>			
Current use	77 (8.0)	19 (4.3)	0.011
Ever used	280 (29.3)	62 (14.1)	<0.001
<i>Age group (n=1393)</i>			
18 - 44 years	589 (61.7)	207 (47.2)	<0.001
45 years and above	365 (38.3)	232 (52.8)	
<i>Sex (n=1393)</i>			
Male	920 (71.9)	359 (81.1)	<0.001
Female	35 (30.7)	79 (69.3)	
<i>Residence</i>			
Urban	439 (64.8)	238 (54.2)	0.004
Rural	518 (72.0)	201 (45.8)	
<i>Education (n=1394)</i>			
Primary and below	354 (66.3)	180 (41.2)	0.147
Secondary and above	602 (70.0)	258 (58.8)	
<i>Occupation</i>			
Employed	786 (72.9)	292 (66.5)	<0.001
Unemployed	134 (53.0)	119 (51.0)	
Student	37 (56.9)	28 (64.7)	
<i>Race (n=1395)</i>			
Malay	769 (71.7)	304 (69.0)	<0.001
Non-Malay	187 (58.1)	135 (31.0)	
<i>Religion (n=1395)</i>			
Muslim	838 (71.3)	337 (76.0)	<0.001
Non-Muslim	118 (53.6)	102 (24.0)	

Variables	Current smokers (n=957) n (%)	Ex-smokers (n=439) n (%)	p
<i>Marital status (n=1394)</i>			
Married/with partner	660 (67.3)	321 (32.7)	0.128
Single/divorced/widowed	295 (71.4)	118 (28.6)	
<i>Age started smoking cigarettes (n=1145)</i>			
< 20 years	807 (84.3)	146 (77.7)	0.025
≥ 21 years	150 (15.7)	42 (22.3)	

Table 2. Characteristics of EC current users by smoking status (n=96)

Variables	Current smokers (n=77) n (%)	Ex-smokers (n=19) n (%)	p
<i>Age started EC</i>			
mean (SD) in years	29.1 (11.1)	29.3 (13.6)	0.923
<i>Frequency of EC use</i>			
Daily	19 (24.7)	8 (42.1)	0.130
Less than daily	58 (75.3)	11 (57.9)	
<i>Frequency of EC use per day (n=92)</i>			
<20 times/ day	59 (79.7)	12 (66.7)	0.236
≥20 times/ day	15 (20.3)	6 (33.3)	
<i>No. of EC puffs per session (n=86)</i>			
Mean (SD)	13.9 (22.8)	25.1 (35.4)	0.218
<i>Reasons for smoking ECs (n=95)</i>			
To try	34 (44.7)	9 (47.4)	0.523
To quit tobacco smoking	12 (15.8)	6 (31.6)	
To reduce tobacco smoking	8 (10.5)	1 (5.3)	
To replace tobacco smoking	6 (7.9)	0 (0)	
To reduce cost of smoking	5 (6.6)	1 (5.3)	
Other	11 (14.5)	2 (10.5)	

Table 3. Characteristics of current EC users among current smokers and ex-smokers

Variables	Current smokers (n=957)			Ex-smokers (n=439)		
	Current EC users (n=77) n (%)	Not current EC users (n=880) n (%)	p value	Current EC users (n=19) n (%)	Not current EC users (n=420) n (%)	p value
<i>Marital status (n=1394)</i>						
18 - 44 years	71 (92.2)	518 (59.1)	<0.001	15 (78.9)	192 (45.7)	0.005
45 years and above	6 (7.8)	359 (40.9)		4 (21.1)	228 (54.3)	
<i>Sex</i>						
Male	75 (97.4)	845 (96.2)	1.000	17 (89.5)	342 (81.6)	0.547
Female	2 (2.6)	33 (3.8)		2 (10.5)	77 (18.4)	
<i>Residence</i>						
Urban	49 (63.6)	390 (44.3)	<0.001	7 (36.8)	231 (55.0)	0.120
Rural	28 (36.4)	490 (55.7)		12 (63.2)	189 (45.0)	
<i>Education</i>						
Primary and below	13 (16.9)	341 (38.8)	<0.001	2 (10.5)	178 (42.5)	0.006
Secondary and above	64 (83.1)	538 (61.2)		17 (89.5)	241 (57.5)	

Variables	Current smokers (n=957)			Ex-smokers (n=439)		
	Current EC users (n=77) n (%)	Not current EC users (n=880) n (%)	p value	Current EC users (n=19) n (%)	Not current EC users (n=420) n (%)	p value
<i>Occupation</i>						
Employed	61 (79.2)	725 (82.4)	<0.001	16 (84.2)	276 (65.7)	0.083
Unemployed	5 (6.5)	129 (14.7)		1 (5.3)	118 (28.1)	
Student	11 (14.3)	26 (3.0)		2 (10.5)	26 (6.2)	
<i>Race</i>						
Malay	62 (80.5)	707 (80.4)	0.985	14 (73.7)	290 (69.0)	0.668
Non-Malay	15 (19.5)	172 (19.6)		5 (26.3)	130 (31.0)	
<i>Religion</i>						
Muslim	70 (90.9)	768 (87.4)	0.366	14 (73.7)	323 (76.9)	0.782
Non-Muslim	7 (9.1)	111 (12.6)		5 (26.3)	97 (23.1)	
<i>Marital status</i>						
Married/with partner	31 (40.3)	629 (71.6)	<0.001	12 (63.2)	309 (73.6)	0.317
Single/divorced/widowed	46 (59.7)	249 (28.4)		7 (36.8)	111 (26.4)	
<i>Age started tobacco smoking</i>						
< 20 years	72 (93.5)	735 (83.5)	0.021	10 (90.9)	136 (76.8)	0.461
≥ 21 years	5 (6.5)	145 (16.5)		1 (9.1)	41 (23.2)	

Table 4. Adjusted associations between demographic variables and current EC use among current smokers and ex-smokers

Variables	Current smokers (n=957)			Ex-smokers (n=439)		
	Current EC users (n=77) n (%)	Adj. OR (95% CI)	p value	Current EC users (n=19) n (%)	Adj. OR (95% CI)	p value
<i>Age group</i>						
18 - 44 years	71 (92.2)	4.83 (1.97-11.86)	0.001	15 (78.9)	3.81 (1.14-12.76)	0.030
45 years and above	6 (7.8)	1.00		4 (21.1)	1.00	
<i>Residence</i>						
Urban	49 (63.6)	1.89 (1.15-3.11)	0.012	7 (36.8)	0.43 (0.16-1.13)	0.088
Rural	28 (36.4)	1.00		12 (63.2)	1.00	
<i>Occupation</i>						
Employed	61 (79.2)	1.00		16 (84.2)	1.00	
Unemployed	5 (6.5)	0.69 (0.26-1.86)	0.468	1 (5.3)	0.21 (0.03-1.65)	0.137
Student	11 (14.3)	2.25 (1.01-5.01)	0.048	2 (10.5)	0.84 (0.16-4.52)	0.838
<i>Marital status</i>						
Married/with partner	31 (40.3)	1.00		12 (63.2)	1.00	0.815
Single/divorced/widowed	46 (59.7)	2.11 (1.24-3.61)	0.006	7 (36.8)	0.88 (0.29-2.66)	

Discussion

This study is the first to report on the national prevalence of EC use among adult current and ex-smokers in Malaysia. Our findings revealed that the overall prevalence rates for the current use of and ever using ECs were higher among current smokers as compared with ex-smokers. This is consistent with the findings of Pearson et al., who found a higher utilization of ECs among current smokers (11.4%) compared to ex-smokers (2%).¹¹ The higher prevalence of EC use among current smokers could also be due to the marketing of ECs as smoking-cessation tools.^{15,16} In view of the popularity of EC use among current smokers, there is a need for more high-quality studies to examine the effectiveness of ECs as tools for quitting smoking.

Among current smokers, the reasons for smoking ECs were mainly wanting to try them, followed by the intention to quit and to reduce tobacco smoking. Similarly, many recent studies showed that the popular reasons for using ECs included health concerns, cutting down and quitting.¹⁷⁻¹⁹ Considering the difficulties in quitting tobacco smoking, ECs are of great interest to smokers who might view them as an option for smoking cessation.¹⁰ However, ECs are currently unregulated in Malaysia, and e-liquids are produced by many small manufacturers. There also remains limited evidence on the potential benefits and risks of EC use.⁹ The overall conclusion from a recent systematic review revealed that EC use was associated with significantly less quitting among smokers in the real world.²⁰ Further research is warranted to examine the long-term impact of EC use on tobacco initiation, cessation and users' health.

Among the current and ex-smokers, younger respondents were more likely to be current EC users than their counterparts. This is consistent with the findings by Dockrell et al.¹⁹ Higher awareness and use of ECs among younger adults may be due to the fact that e-cigarettes are usually marketed through social and electronic media.²¹ Since EC use could potentially lead to the initiation of tobacco smoking and increasing nicotine addiction, further surveillance is warranted among the younger adults, as they are particularly susceptible to the influences of social media.²²

Moreover, we found that among current smokers, current EC users were more likely to be students and urban residents, which is consistent with the findings by Goniewicz et al.²³ The higher

prevalence of EC use in urban populations might be explained by easier access to the Internet in the more urbanized areas of the country, as web sites are the main channels for advertising EC products. The use of ECs among students who are current smokers is worrying. A recent study has shown that the use of ECs was associated with heavier use of conventional cigarettes, and it might be creating another new pathway for adolescent students to become addicted to nicotine by reducing the chance of quitting conventional cigarettes.²⁴

Limitations and strengths of the study

The principle strength of this population-based EC survey is that it provides the policy makers with reliable and up-to-date information on EC use among the smokers and ex-smokers in the population. This data is important, as EC use has great potential to influence smoking and quitting behaviour in Malaysia.

There are several limitations to this study. Firstly, the survey responses were mainly self-reported by participants, which could lead to reporting bias. Thus, the accuracy of self-reported EC use is uncertain. Second, small sample sizes for some subpopulations resulted in less precise estimates, which could fail to be representative. Finally, the cross-sectional nature of this study does not allow inferences to be drawn about the causal nature of the associations found, for example, whether ex-smokers used ECs to help them to quit smoking or took up ECs after they had successfully quit smoking conventional cigarettes could not be determined. Further follow-up studies are needed to examine the prospective association between EC use and smoking cessation.

Conclusions

In conclusion, this study showed that the current use of and ever using ECs were higher among current smokers. The reasons given for initiating EC use among current smokers were mainly wanting to try it, followed by intention to quit and to reduce tobacco smoking. Current EC use was more likely among current smokers who are younger, urban residents, single/divorced/widowed and students. Therefore, EC cessation intervention strategies and policies should target these high-prevalence groups. Moreover, there is an urgent need for further research and preventive strategies and policies to protect younger adults and student from this harmful exposure.

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How does this paper make a difference to general practice?

- This study showed that current and ever using e-cigarettes occurred more frequently among current smokers. Hence, e-cigarette cessation intervention strategies and policies should target at this high-prevalence group.
- Among the current and ex-smokers, younger respondents and students were more likely to be current e-cigarette users. Thus, there is an urgent need for further research and preventive strategies and policies to protect younger adults and students from this harmful exposure.

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Mental Health Status and Its Associated Factors Among Caregivers of Psychiatric Patients in Kuching, Sarawak

Ivan Vun JS, Cheah WL, Helmy H

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Authors:

Cheah Whye Lian

(Corresponding author)

PhD

Department of Community Medicine and Public Health, Faculty of

Medicine and Health Sciences

Universiti Malaysia Sarawak

Malaysia.

E-mail : wlcheah@unimas.my

Ivan Vun Jan Shui

DrPH

Faculty of Medicine and Health

Sciences, Universiti Malaysia

Sarawak, Malaysia.

E-mail : ivanvun@gmail.com

Helmy Hazmi

MComMed

Department of Community Medicine and Public Health, Faculty of

Medicine and Health Sciences

Universiti Malaysia Sarawak

Malaysia.

E-mail : hhelmy@unimas.my

Abstract

Introduction: Caregivers have a high risk of mental health disorders. The quality of patient care is inseparable from the mental health status of caregivers. The objective of this research was to study the mental health status among caregivers of psychiatric patients and its associated factors.

Method: A cross-sectional study was conducted among 198 caregivers in Kuching from January till July 2014. The respondents were recruited using systematic sampling and were required to provide information on sociodemographic and environmental factors as well as complete the Hospital Anxiety and Depression Scale (HADS) questionnaire. The data was analysed using the IBM SPSS Statistical Software Version 20.0.

Results: The prevalence rates of anxiety and depression among caregivers were 32.8% and 27.8%, respectively. The caregiver's age (OR=0.97, 95% CI = 0.953 - 0.996), the perception of caregiving as an economic burden (OR= 2.70, 95% CI= 1.256 - 5.803) and the dependence of the patient (OR= 2.27, 95% CI= 1.087 - 4.719) were associated with anxiety. A caregiver who was male (OR= 2.21, 95% CI= 1.143 - 4.262), a caretaker who held the perception that a patient was dependent on them (OR=2.53, 95% CI= 1.203 - 5.337) , and a caretaker who lacked stress-coping skills (OR=2.48, 95% CI= 1.030 - 5.973) were found to be significant factors in depression.

Conclusion: A high prevalence of probable anxiety and depression among caregivers points to the need to screen caregivers. There is a vital need to train healthcare workers to be able to detect early anxiety and depression. Culturally sensitive research should be carried out for different ethnicity, and improving the support system for caregivers is necessary.

Introduction

Patients with mental illness are often stigmatized, especially in the Asian countries such as Malaysia.¹ The situation is complicated by multi-cultures, social backgrounds, religions and beliefs.² The discrimination against patients also extends to their family members. Based on hospital figures, the prevalence of mental illness in Malaysia in 2000 was 10.7%.³ This figure was increased to 29.2% by the National Health and Morbidity survey conducted in 2015.⁴ Mental health services in Malaysia are relatively young compared to those of the developed countries, but Malaysia has moved towards deinstitutionalization of patients since the 1970s and providing mainly community-based treatment.⁵ Patients who are discharged into the community are expected to adapt to society. Many informal caregivers, who are not trained, thus shoulder the responsibility of providing for their care.

Caregiving is a burden that is associated with poor quality of life.^{6,7} A local study showed high prevalence rates of depression (29.4%) and

anxiety (48.6%) among caregivers.⁸ A survey on the mental health of informal caregivers in Ontario found that caregivers had higher rates of affective (6.3% vs 4.2%) and anxiety (17.5% vs 10.9%) disorders compared to non-caregivers.⁹ Furthermore, caregivers of patients with mental illness were found to have high rates of mental health difficulties (>80%) compared to the general population.¹⁰ They experience significantly more caregiving burdens than caregivers of those with other chronic medical illnesses.¹¹ Factors affecting a person's mental health include persistent socio-economic pressures, rapid social change, stressful work conditions, gender discrimination, social exclusion, unhealthy lifestyle, violence, physical ill-health, human rights violations, and other specific psychological and personality factors.^{10,12} For caregivers, the impact of caregiving depends on the type of patient's disability, the stage of the caregiving process, socioeconomic status, social support and the caregiver's stress-coping strategy.¹³ Cultural beliefs and practices were also found to be associated with mental health problems in Malaysia.¹⁴

Both the physical and mental well-being of caregivers inevitably affects the quality of care of the psychiatric patient. In Malaysia, the care of a discharged patient depends on ongoing psychoeducation and close follow ups.¹⁵ There are limited studies on informal caregivers for psychiatric patients in East Malaysia. This study was done to serve as a baseline study of the mental health status among informal caregivers of psychiatric patients and its associated factors. As psychiatric patients are treated in the community, new burdens related to health issues among caregivers may emerge. The findings from this study may serve as a guide for public health specialists in planning programmes to tackle this issue according to the local contexts.

Materials and Methods

The participants in this study were recruited from Sarawak General Hospital and Sentosa Hospital, two of the major hospitals with the most psychiatric patients in the state of Sarawak. A cross-sectional study was conducted from January to July 2014 at these hospitals, as they are the main admission, discharge and follow up point for patients with psychiatric illnesses in Kuching. Ethical approval was obtained from the ethics committee of the Universiti Malaysia Sarawak (UNIMAS) and National Medical Research Register (ID: NMRR-13-1512-18958). Verbal and written consent were sought from the respondents after they were assured of their anonymity and confidentiality.

Using the lifetime risk of depression among men in the Southeast Asian Region of 7% and a lifetime risk among females of 20%, the sample size for this study was computed using the two-proportion formula in the PS software.¹⁶ With a power of 0.8 and type I error $\alpha=0.05$, the calculated sample size was found to be 107 samples per arm, for a total sample size of 214. The final sample size was 224 after including a 5% non-response rate. Systematic sampling was employed whereby the caregiver of every third patient who entered the clinic was recruited. The respondents had to be Malaysian, aged 18 years old and above and been a caregiver for at least six months. Formal caregivers and those who could not understand Malay or English were excluded from the study.

The respondents were required to fill in questionnaires to provide information on their sociodemographic profiles and answer questions pertaining to the individual and environmental factors associated with their mental health.

They were also required to complete the Hospital Anxiety and Depression Scale (HADS)¹⁷ questionnaire. For the latter, the respondents could choose to answer either the English or the validated Malay version.¹⁸ The HADS questionnaire is a screening tool with seven items on both anxiety and depression. Each item can be scored on a four-point Likert scale of 0-3 (not present-considerable), resulting in a minimum score of 0 and maximum score of 21. A score of ≤ 7 is considered to be "normal"; 8-10 is considered to be a "mild case", 11-14 a "moderate case", and 15-21 a "severe case" for both anxiety and depression. Generally, a score of ≥ 8 is considered to be a "case" for both anxiety and depression. In Malaysia, the Depression Anxiety Stress Scale (DASS) is used widely in health clinics. However, in this study, HADS was chosen, as it has fewer items, performs consistently with DASS, and is sensitive, specific (0.8 for both the anxiety and depression subscales) and reliable (with the reported Cronbach's alphas all exceeding 0.7).^{18,19}

The researchers recruited the respondents on clinic days. Respondents who agreed to participate in the study were given the questionnaire to fill out at the clinic. Questions which were unclear were clarified by the researchers in the language familiar to the respondent. A pre-test using 15 respondents was undertaken to test the suitability of the questionnaires for the local context at the out-patient department of Batu Kawa health clinic in Kuching.

The data obtained were checked for inconsistencies, then cleaned, coded, entered and analysed using the IBM SPSS Statistical Software Version 20.0. Descriptive analyses of the sociodemographic, individual and environmental factors and the prevalence of probable anxiety or depression were done via frequencies, means and standard deviations. Univariate analyses were done to select significant variables via univariate tests before entering the variables into multivariate analysis. Multiple logistic regression was applied to determine factors associated with mental health status. Multivariate models were selected by conducting forward and backward LR (likelihood ratio) tests and using the Enter method. Interactions, multicollinearity, assumptions and outliers were considered and investigated. Model fitness was assessed using the ROC (receiver operating characteristic) curve, Hosmer-Lemeshow goodness-of-fit test

and classification table. A p value of <0.05 was considered statistically significant. An odds ratio of more than 1 implies that there is an increased odd of being associated with the condition disorder, while less than one implies otherwise.

Results

Out of a total of 225 respondents who were invited to participate in the study, only 198 participated, giving a response rate of 88%. Among those who did not participate, 18 did not fulfil the inclusion criteria, and the remaining 9 did not complete the questionnaires for various reasons, such as they found it a hassle to answer the questions while they were engaged in caregiving at the clinic and they refused to answer certain questions.

Table 1 shows that 54% of the respondents

were female. The mean age of respondents was 42.4 (SD = 13.12), with the youngest being 18 years old and the oldest being 70 years old. The age group 45 – 54 years old had the highest proportion of respondents (25.8%) followed by those in the 35 – 44 age group (25.3%). Only 5.1% of the respondents were aged 65 years and above. However, more than one-tenth (12.1%) were less than 25 years old. The proportions of Chinese and Malay were 36.4% and 33.3% respectively, making up about two-thirds of the total respondents. In terms of religion, most of the respondents were Christians (44.4%), followed by Muslims (34.8%). A majority of the respondents had received at least a primary school education (89.4%), while half of the respondents (54.5%) worked. Most of the respondents (82.8%) reported a low household income of less than RM 2300 per month.

Table 1. Sociodemographic characteristics of respondents (N=198).

Variable	n(%)
<i>Gender</i>	
Male	91 (46)
Female	107 (54)
<i>Age Group</i>	
<25	24 (12.1)
25-24	35 (17.7)
35-44	50 (25.3)
45-54	51 (25.8)
55-64	28 (14.1)
>65	10 (5.1)
<i>Ethnicity</i>	
Malay	66 (33.3)
Chinese	72 (36.4)
Iban	24 (12.1)
Bidayuh	31 (15.7)
Other	5 (2.5)
<i>Education status</i>	
Not educated	21 (10.6)
Received at least primary education	177(89.4)
<i>Employment status</i>	
Employed	108 (54.5)
Unemployed	90 (45.5)
<i>Household income (per month)</i>	
<RM2300	164 (82.8)
RM2300-RM7000	30 (15.2)
>RM7000	4 (0.0)

The mean duration of caregiving was 7.8 (SD=7.47) years. More than three-quarters (77.8%) of the informal caregivers were immediate family members, with almost half (46.5%) of these caregivers being the children of the patients and almost one-quarter (24.2%) being the patients' own siblings. The proportion of respondents who resided with the patient was 84.3%. More than half of the respondents (54.5%) were full-time caregivers. Only 12 caregivers reported of having any chronic disease or disability. A total of 79.3% of respondents perceived that the patients could take care of themselves, and 76.3% of respondents reported having familial support or a supportive network. Caregiving was reported to be an economic burden by 18.7% of the respondents. With regards to relieving stress, 86.4% of the respondents reported knowing how to release stress when they were worn out (see **Table 2**).

Table 2. Profiles of the caregivers (N=198).

Variable	n(%)
<i>Relationship with the patient</i>	
Immediate family members ¹	91 (46)
Non-immediate family members ¹	107 (54)
<i>Time spent with patient</i>	
Full time	108 (54.5)
Part time	90 (45.5)
Caregiver having disability or chronic illness	12 (6.1)
Caregiver thinks patient is independent	157 (79.3)
Caregiver knows method of stress release	171 (86.4)
Caregiver resides with patient	167 (84.3)
Caregiver has supportive network or familial support	151 (76.3)
Caregiver thinks caregiving is an economic burden	37 (18.7)

¹ Immediate Family Members = parents, siblings, children, spouse. Non-Immediate Family Members = cousins, friends, neighbours and others.

Table 3 presents the prevalence of probable anxiety and depression among the respondents. The prevalence of probable anxiety was found to be 32.8% among the respondents with a mean HADS sub-scale score for anxiety of 9.8 (SD=2.09). In terms of probable depression, 27.8% of the respondents were found to be affected, and the mean HADS sub-scale score for depression was 10.0 (SD=1.84). There were 40 (20.2%) respondents who had both probable anxiety and depression.

Table 3. Prevalence of probable anxiety and depression among caregivers (N=198).

Types of probable disease disorder	n(%)
<i>Anxiety</i>	65 (32.8)
Male	91 (46)
Female	107 (54)
<i>Depression</i>	55 (27.8)
Male	32 (35.2)
Female	23 (21.5)
<i>Normal</i>	118 (59.6)

Age was found to be a protective factor. With every unit increase in age, the odds of probable anxiety were 0.97 (95% CI= 0.953 - 0.996). Caregivers who perceived that the patient under their care was dependent on them had a higher chance of being diagnosed with probable anxiety (OR=2.27, 95% CI= 1.087 - 4.719). Similarly, caregivers who reported caregiving as an economic burden were more likely to be anxious (OR= 2.70, 95% CI= 1.256 - 5.803) (see **Table 4**).

Table 4. Factors associated with anxiety (N=198).

Variable	Crude OR	Adjusted OR (95% CI)	B	Wald	df	P value ¹
Age	0.97	0.97 (0.953, 0.996)	-0.028	5.02	1	0.025
<i>Caregiver thinks patient is independent</i>						
Yes	1.00					
No	2.69	2.27(1.087,4.719)	0.818	5.765	1	0.029
<i>Caregiver thinks caregiving is economic burden</i>						
Yes	3.03	2.70 (1.256, 5.803)	0.993	6.468	1	0.011
No	1.00					

df= degrees of freedom, CI= Confidence Interval, OR= Odds Ratio, 1Multiple Logistic Regression (no multicollinearity, assumptions were all met), Receiver Operating Characteristic = 0.685, Overall percentage classification = 91.0%, Hosmer and Lameshow test p-value = 0.089.

Male caregivers were two times more likely to be diagnosed with depression compared to females (OR= 2.21, 95% CI= 1.143 - 4.262). Caregivers who reported that the patient was dependent were 2.53 times more likely to be diagnosed with depression (95% CI= 1.203 - 5.337), while caregivers who did not know how to release stress were 2.48 times more likely to be depressed (95% CI= 1.030 - 5.973) (see **Table 5**).

Table 5. Factors associated with depression (N=198).

Variable	Crude OR	Adjusted OR (95% CI)	B	Wald	df	P value ¹
<i>Gender</i>						
Female	1.00					
Male	1.98	2.21 (1.143, 4.262)	0.792	5.558	1	0.018
<i>Thinks patient is independent</i>						
Yes	1.00					
No	2.53	2.53 (1.203, 5.337)	0.930	5.989	1	0.014
<i>Caregiver knows way of stress release</i>						
Yes	1.00					
No	2.38	2.48 (1.030, 5.973)	0.909	4.108	1	0.043

df= degree of freedom, CI= Confidence Interval, OR= Odds Ratio, 1Multiple Logistic Regression (no multicollinearity, assumptions were all met), Receiver Operating Characteristic = 0.648, Overall percentage classification = 94.4%, Hosmer and Lameshow test p-value = 0.746.

Discussion

Caregiving is a life-changing event that involves added responsibilities, financial burdens, adjustments in terms of time management and changes in the caregivers' social lifestyle, among others. The objective of this study was to study the socioeconomic, individual and environment factors that were associated with mental health status (anxiety and depression) among caregivers of psychiatric patients. Several factors were found to be important and may be of interest to healthcare professionals.

In this study, the finding that there were higher prevalence rates of probable anxiety and depression compared to the general population were congruent with a previous study.⁸ These findings can be due to the high sensitivity

and specificity of the HADS screening tool. However, our reported figure is low compared to another previous local study that used HADS and reported the prevalence rates of probable anxiety and depression to be 48.6% and 29.4%, respectively.⁸ The differences may be explained by the different type of patients (cancer) that the caregivers in that study were caring for. The significant prevalence rates of probable anxiety and depression among caregivers warrants a proper diagnosis. More effort should be directed at identifying at-risk caregivers as early as possible so that early preventive steps can be formulated and to ensure that lesser cases are missed.

Unamendable factors such as age, gender, ethnicity, and so forth play important roles in the disease diagnosis. Consistent with

many previous studies, female respondents were the majority in this study.¹¹ However, the ages of the caregivers were younger than expected. Caregivers gained experience and enjoyed personal growth by learning on the job caring for their patients. Lack of experience in providing aid in the activities of daily living may be a reason why males are deterred from being a primary caregiver. In addition, a huge portion of time is spent on managing patients, which, coupled with the need to manage their own disabilities or chronic diseases, may take a toll on the mental health of the caregivers themselves.¹² However, this was these were not found to be significant in the current study. Although the types of disabilities or diseases that a patient has may impact the health of their caregivers, this topic was not addressed as one of the main focuses of the current research.

Caregiving affects both the mental and physical health of the caregivers. It was initially thought that the older caregivers would experience more stress and be at higher risk of developing mental illnesses, as they belong to the group commonly afflicted with poorer physical functionality and comorbidities. However, this study showed otherwise. The possible explanation for this finding is that aging moulds psychological immunity to stressful experiences, thereby reducing emotional responsiveness while exerting an increased capability to control emotion that could only come with age.²⁰

The current study also highlighted the fact that males have a higher preponderance towards depressive disorders.^{10,12} Male caregivers in this study were found to be twice as likely to have depression. Males are usually breadwinners with less exposure to caregiving, thus caregiving can become a source of stress, leading to depression. Female caregivers are relationship oriented and are more likely to share their problems with others.¹³ Hence, finding more undiagnosed males with depression is to be expected, as they are less expressive in their feelings and are less likely to seek outside help.

Anxiety and depression can co-exist. Caregiving can be a task that affects caregivers in multiple ways. At one end of the spectrum, the caregiver may feel happy and grateful for being given the chance to help the patient, while, at the other end, they may feel sad and sorry or even fear for the patient under their care. The changes in the effect on the caregiver may occur abruptly

and a few times a day. An individual who does not know how to deal with stress is prone to affective disorders.¹³ When caregivers become overloaded with stress, they succumb to illness. Although income, employment status and education level were not found to be significant in the current study, caregivers who perceived caregiving as an economic burden tend to be more anxious. Caregiving causes loss in family savings and income. The logistical issues alone are costly, especially in Sarawak, where the geographical situation poses a great challenge. Caregivers may find caregiving expensive and unaffordable and themselves having to forego necessities in order to cope with caregiving expenses.

Mental illness is perceived of and expressed differently according to one's cultural background and ethnicity.² There was a difference in the susceptibility to depression and anxiety among different ethnic and racial groups according to the literature.²¹⁻²² However, the current study did not establish relationships between ethnic and racial factors and mental illness, as the population in the study was small and generally homogenous in terms of having lifestyles that have done away with many traditional beliefs. The caregivers received at least a formal primary education and were living in an urban setting with access to telecommunication and media hubs. Despite this, further research is needed in this area.

This study suggested there was a positive correlation between a caregiver's depression and their perception of their patient as being dependent. This single common factor was associated with both probable anxiety and depression in the current study. Caregivers seek support from friends and families, the doctor's office and support groups. When they fail to find support, they may fall into despair. In addition to moral support, knowledge inputs from these sources help caregivers to offset issues arising from patients' dependencies, without which, they might have problems coping. In addition, a lack of knowledge and unclear expectations in terms of the outcomes for the patient may place a caregiver in a state of distrust, thus not allowing others who might be more capable to care for the patient.

Although having a supportive environment was not found to be a significant independent variable, local mental health groups

or associations should not neglect the psychological needs of caregivers.

We acknowledge that the difference in anxiety and depression among caregivers for patients with different diseases was not considered and that culturally-sensitive research pertaining to belief systems within the local context was not done, and that no cause and effect relationships could be established in this study.

Conclusions

The prevalence of anxiety and depression among caregivers of psychiatric patients is high. The age factor and perception of caregiving as an economic burden are crucial factors in predicting anxiety, while being a male caregiver who is also unequipped to cope with stress was important in the development of depression. The perception of the patient as being dependent was a common denominator for the development of both anxiety and depression. The HADS can serve as an alternative screening tool for anxiety and depression among caregivers. Healthcare worker knowledge, training of staff and regular screening are vital for

the detection of hidden cases. Healthcare professionals must be aware that caregivers for patients suffering from other diseases are also at risk. Culturally sensitive research should be undertaken in the future, as there are more than 20 different ethnicities in Sarawak. More pragmatic data is needed to delineate the relationship between income and risk to the mental health of a caregiver. Due to the nature of the study, generalizations can only be made to similar settings.

Competing Interest

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

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How does this paper make a difference to general practice?

It serves as a baseline study of the prevalence rates of anxiety and depression among caregivers of psychiatric patients and their associated factors in a local context.

1. Offers the alternative HADS screening tool instead of the DASS tool currently used.
2. Results can be compared with those for caregivers of patients with other diseases.
3. Highlights the possibility of the emergence of new burden of health issue among the caregivers, as psychiatric patients are now treated in the community.
4. Provides knowledge on the current status in the studied region, providing a guide for the public health specialist to use to plan programming accordingly.

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The unusual traumatic locked young knee

Mohd Miswan MF, Latiff Alsagoff SNASA, Muhamad Effendi F, Ibrahim MI

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Authors:

Mohd Fairudz Mohd Miswan

(Corresponding author)

MS (Orth)

Surgical Sciences Cluster,
Faculty of Medicine,
Universiti Teknologi MARA,
Selangor, Malaysia

Sharifah Nor Amirah Syed Abdul Latiff Alsagoff

MBBS

Surgical Sciences Cluster
Faculty of Medicine
Universiti Teknologi MARA
Selangor, Malaysia.

Ferdhany Muhamad Effendi

MS (Orth)

Surgical Sciences Cluster
Faculty of Medicine
Universiti Teknologi MARA
Selangor, Malaysia.

Mohd Ikraam Ibrahim

MS (Orth)

Surgical Sciences Cluster
Faculty of Medicine
Universiti Teknologi MARA
Selangor, Malaysia.

Abstract

Locked knee is an orthopaedic condition requiring urgent treatment. Although the condition can be diagnosed via history, physical examination and imaging studies, the cause of the mechanical obstruction may only be apparent during arthroscopic examination of the knee joint. It is known that imaging plays a role in evaluating the integrity of intra-articular structures, however in some atypical cases, imaging cannot identify the definitive cause of locked knee. Here we report on two cases of locked knee, due to uncommon conditions which were unobservable via normal imaging studies.

Introduction

Locked knee is an incapacitating condition characterized by inability to achieve a full extension of the knee. It should be treated promptly and accordingly, because a prolonged locked position of the knee could result in contractures leading to flexion deformity. Subsequently, persistent weight bearing on a flexed knee will result in ineffective load distribution on the tibio-femoral articulation, thus promoting premature cartilage degeneration. Locked knee is caused by a mechanical obstruction from any intra-articular abnormalities. Common causes of locked knee include traumatic tear of the meniscus, cruciate ligament injuries and osteochondral fractures.¹ Magnetic resonance imaging (MRI) plays an important role in the initial work-up of a locked knee.² Apart from identifying the cause of the mechanical obstruction, an MRI can provide information about the pathology of other structures within the knee, such as a subchondral edema, cruciate ligament tears and the condition of the hyaline cartilage. With the advance in arthroscopic technique and instrumentation in the treatment of locked knee, open knee surgery is very rarely indicated. Here, we report on two atypical cases of locked knee with normal MRI findings.

Case 1

A 35-year-old male with no known prior medical condition presented with right knee pain and swelling 2 weeks after a trivial injury to the right knee. He twisted his knee while trying to avoid falling while walking

on a slippery floor. Initially he was treated by a general practitioner with oral analgesics and was advised to rest. Despite the partial resolution of the knee pain over the course of 2 weeks, he noticed that he was unable to fully straighten his right knee. There was no history of recurrent or multi-joint pain. Examination of the right knee revealed a mild effusion and generalized tenderness over the joint line. The range of motion was restricted to flexion of 30° to 100°. Radiographs of the knee did not reveal abnormalities. An MRI showed both medial and lateral meniscus was normal and the anterior and posterior cruciate ligaments were intact. A preoperative examination under anesthesia revealed similar physical findings. Subsequently, arthroscopy was performed. Unexpectedly, we discovered that the tibial plateau was covered by white 'chalky' material (**Fig. 1**). The synovium and both cruciate ligaments were intact, and there was no tear of the meniscus. Debridement of the whitish material was successfully performed during the arthroscopy. Intra-operatively, following the procedure, the right knee could be passively extended to 0°. Postoperatively, his recovery was uneventful and he was allowed to resume full-weight-bearing ambulation. A histological evaluation of the whitish material obtained intra-operatively showed monourate crystals, suggestive of tophi. Thereafter, he was started on urate-lowering therapy after a blood investigation revealed hyperuricemia at a level of 747 micromol/L. Follow up at 6 months showed no symptoms suggesting a recurrence. His knee range of motion was normal. Regular follow up with our rheumatologist was also arranged to monitor and further manage his hyperuricemia.

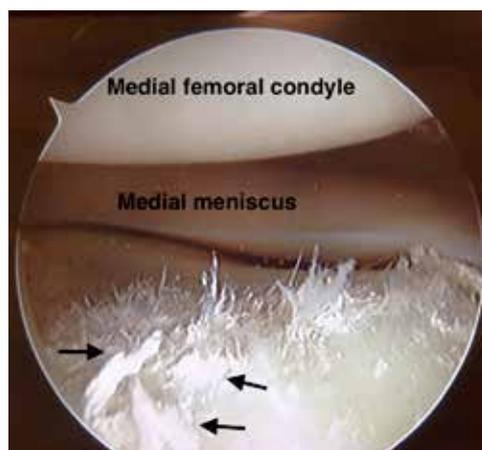


Fig. 1 Intra-arthrosopy photograph showing the medial tibial plateau deposits of white, 'chalky' material (black arrows).

Case 2

A 32-year-old male was reviewed at the clinic for painless locking of the right knee. He was seen initially in casualty 2 weeks prior to presentation for acute right knee pain and swelling. On that day, he sustained a twisting knee injury during a fall while trying to climb into his vehicle. Initial radiographs of the knee done in casualty did not reveal any bony injury, and he was allowed home with a slab to immobilize the knee. Upon removal of the slab during follow up at 2 weeks, he was unable to full extend his right knee, although the pain was significantly reduced. On examination, a mild effusion was noted, and the medial joint line was tender. The knee was fixed at 20° of flexion. The distal neurovascular status was intact. An MRI revealed no tear of the medial meniscus, and the cruciate ligaments were intact. During arthroscopy, it was revealed that the medial compartment of the knee was occupied with a well-defined ovoid soft tissue mass arising from the synovium (**Fig. 2**). The size of the mass was approximately 10mm x 5mm. The arthroscopic impingement test indicated the mass became impinged between the femoral condyle and the tibial plateau at 45° of knee flexion and full extension was not possible. After excision of the mass, full extension of the knee was achieved. Postoperatively, range of motion exercises were prescribed once the pain was tolerable. A histological evaluation of the excised mass revealed scattered multinucleated giant cells on a background of mononuclear fibroblasts,

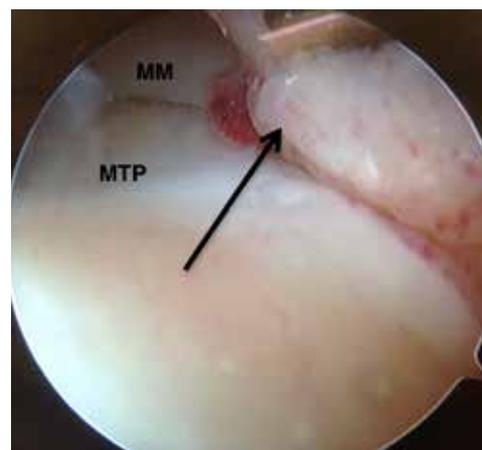


Fig. 2 Intra-arthrosopy photograph showing the tumor (black arrow) in the medial compartment of the knee. (MM = medial meniscus, MTP = medial tibial plateau.)

Discussion

Locked knee is an orthopaedic condition characterized by inability to fully extend the knee due to a displaced intra-articular structure.¹ The most common cause of locked knee is a bucket handle tear of the meniscus. Other causes include cruciate ligament injury, osteochondral fractures, osteoarthritis and synovial plicae.³ These conditions result in a loose fragment, which becomes entrapped between the femoral condyle and tibia plateau during extending movement of the knee, thus preventing full extension. Locked knee can be diagnosed accurately with adequate history and careful clinical examination. A definite history of injury, especially involving rotational and bending forces on the knee, and physical findings of joint line tenderness and effusion are notable features of locking due to mechanical obstruction.³ MRIs have been suggested to differentiate between 'true' locking and 'pseudo'locking, a condition in which the inability to fully extend the knee is due to pain or muscle spasms, and not a mechanical obstruction.⁴ In our practice, an MRI is performed to detect injury any other structures, such as the cruciate ligaments and the articular cartilage. This practice facilitates preoperative planning and allow us to counsel the patient regarding the procedures and postoperative rehabilitation.

Gouty arthropathy is characterized by hyperuricemia due to purine metabolism dysfunction. This hyperuricemic state results in the deposition of monosodium urate crystals in soft tissue and joints. Accumulation of this crystal also known as tophi, which,

in the knee joint, could lead to the formation of a loose body. It is a rare, but known cause of knee locking. However, evidence in the literature is scanty and consist mostly of case reports.^{5,6,7} MRI features of intra-articular tophi are heterogenous masses with intermediate intensity in both T1 and T2 weighted images. These masses are due mainly to the degree of calcification of the tophi.⁸ As with our patient (Case 1), a case has been reported previously in which an MRI performed preoperatively did not reveal these characteristic features.⁶ It is probable that the amount and degree of calcification of the tophi in our patient's knee was very minimal, thus it was not detected during the MR examination. As in our case, arthroscopic debridement has been successful in restoring full range of motion in most cases of locking due to intra-articular tophi.^{6,7}

LNS is a localized form of benign proliferative tumour arising from the synovium, for which the aetiology is not fully understood. Trauma, as well as allergic, toxic and genetic factors have been implicated in the pathophysiology of the condition.⁹ In our case (Case 2), the lesion arose from the synovium close to the medial compartment of the knee. This resulted in the mass becoming entrapped between the medial femoral condyle and medial tibial plateau, preventing full extension of the knee. Locked knee is one of the manifestation of this intra-

articular lesion, while other reported clinical features include knee instability, anterior knee pain and knee swelling.⁹⁻¹¹ MRI findings suggestive of LNS are non-specific. These include soft tissue masses with an iso- or hyper-intense signal of T1 and variable signal intensity of T2 in weighted images. It is probable that the mass in our case was not detected due to its relatively smaller size as compared to others in the literature.¹² Although histologically similar to the more diffuse pigmented villonodular synovitis (PVNS), LNS lacks the feature of frond-like projections and significant hemosiderin deposition.¹² It is important to distinguish between the two forms of benign proliferative tumors because, while LNS is treatable by simple excision and has a low recurrence rate, PVNS warrants an extensive synovectomy due to its high recurrence rate.¹² Arthroscopic resection is recommended as the best treatment for LNS of the knee, except in cases of large-sized tumors, for which an arthrotomy may be required.⁹

Conclusion

These two cases illustrate atypical causes of locked knee with no identifiable pathology on MRI evaluation. Both were treated with an arthroscopic excision of the obstructing pathology and the patients had good functional outcome.

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Intrauterine contraceptive device embedded in bladder wall with calculus formation removed successfully with open surgery

Tan JH, Lip HTC, Ong WLK, Omar S

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Authors:

Tan Jih Huei

(Corresponding author)
(MRCS)

Department of General Surgery
Hospital Sultanah Aminah, Jalan
Abu Bakar, Masjid Sultan Abu Bakar
80000 Johor Bahru, Johor
Malaysia.
E-mail: huei_87@hotmail.com

Henry Tan Chor Lip

MD
Department of General Surgery
Faculty of Medicine, National
University of Malaysia Medical
Centre, Kuala Lumpur,
Malaysia.
Email: relas1402@gmail.com

William Ong Lay Keat

(MRCS)
Department of Urology, Hospital
Sultanah Aminah, Johor Bahru
Malaysia.
Email: william_olk@hotmail.com

Shamsuddin Omar

(FRCS)
Department of General Surgery
Hospital Sultanah Aminah, Johor
Bahru, Malaysia.
Email: shamm1970@yahoo.com

Abstract:

An Intrauterine contraceptive devices (IUCD) is commonly inserted by the primary health care physician. It can migrate into pelvic or abdominal organs. When a pregnancy occurs following an insertion of an IUCD, there should be a high suspicion of uterine perforation or possible migration. A radiograph can be done in the primary health care clinic to search for a missing IUCD. Early referral to the urology service is warranted when a patient presents with recurrent urinary tract infections. Removal of an intravesical IUCD can be managed with cystoscopy, laparoscopy or open surgery. Herein, we report a case of IUCD migration into the bladder. This case will highlight the importance of proper technique, careful insertion and the role of ultrasound.

Introduction

Intrauterine contraceptive devices (IUCD) can cause perforation of the uterus and migrate into pelvic or abdominal organs. Perforation of the urinary bladder by an IUCD is not a common occurrence. IUCD perforations can be classified into four types according to the anatomical compartments involved. The first compartment is within the uterine cavity, the second is confined to the myometrium and the third compartment is a breach of the peritoneal cavity. When the IUCD penetrates the neighboring viscera, such as the bowels or bladder, it is type 4.¹ There are several cases of an IUCD wandering to the pelvis and abdominal organs reported in Malaysia^{2,3}. Here, we describe a rare case of IUCD migration into the bladder. To our knowledge, this is the first case ever to be reported in Malaysia.

Case presentation

A 42-year-old female presented with dysuria for the past 10 months. She also had lower urinary tract symptoms, including frequency, nocturia, a sense of incomplete voiding and suprapubic discomfort. She was blessed with four children before she had an IUCD inserted 13 years ago. Five years later, she had two subsequent vaginal deliveries. On physical examination, the abdominal and vaginal examinations were

unremarkable. Her white cell count and renal function were within normal limits. The urine cultures were positive for extended-spectrum beta-lactamases (ESBLs) *E coli*, which are sensitive only to Carbapenem, Tazobactam/Piperacillin or Amikacin. In addition to an incidental finding of a bladder calculus in the abdominal radiograph (Fig. 1), a transabdominal ultrasound and computed tomography revealed an IUCD within the pelvic cavity which was embedded into the muscular bladder dome. It measured 3.4x1.5cm at the inferolateral wall of the bladder (Fig. 2).



Figure 1. Abdominal radiograph revealing IUCD with stone formation



Figure 2: Computed tomography revealing IUCD with intravesical stone formation (axial, sagittal and coronal views)

Cystoscopic examination revealed the vertical limb of the IUCD penetrating into the bladder mucosa with its tip covered with stone formation (Fig. 3).



Figure 3: Cystoscopy showing the vertical arm of IUCD penetrating the bladder mucosa (red arrow) and its body covered with stone.

Following 2 weeks of antibiotic treatment for urinary tract infection, a midline laparotomy was performed whereby the bladder was explored at its dome close to the anterior bladder wall. The horizontal arms of the IUCD were embedded in the bladder wall, and the vertical arm was covered with stone formation. The migrated IUCD together with the stone was extracted. The bladder defect was repaired with two layers of absorbable sutures (Fig. 4, 5). The patient recovered well postoperatively, with the catheter removed following a normal cystogram.



Figure 4: Intraoperative Picture

- * The IUCD with its horizontal arm embedded within the bladder wall (red arrows) and vertical arm covered by stone within the bladder cavity (blue arrow).
- ** bladder opening after IUCD removal (black arrow)

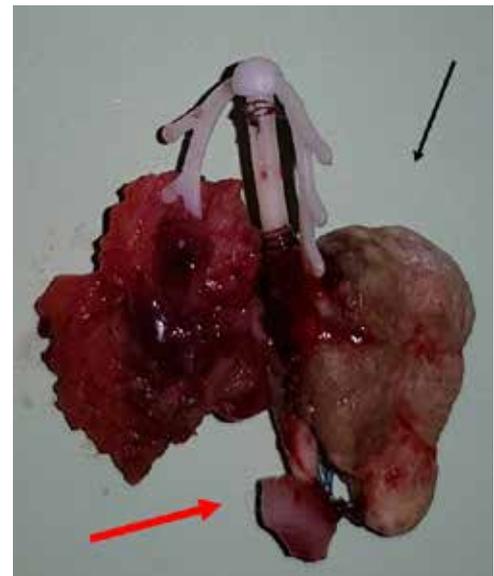


Figure 5: IUCD Removal

- * stone encrusted at copper part of vertical arm (black arrow)
- ** distal tip of vertical arm piercing bladder mucosa (red arrow)

Discussion

The IUCD is one of the most common modes of contraception. It is frequently inserted by primary health care practitioners. The incidence of IUCD migration and uterine perforation is reported as 1.9–3.6 per 1000 insertions.⁴ It is believed that perforation occurs mostly at the time of insertion, but it may also occur spontaneously at a later time or during puerperium.⁵ Therefore, it is of utmost importance to observe the proper insertion technique. A simplified insertion technique without prior pelvic examination and sounding has been described.⁶ It was concluded that this may reduce the need for instrument use during insertion and, consequently, the pain associated with insertion. However, ultrasound guidance during insertion was highlighted. A recent trial also suggested that ultrasound-guided insertion may be beneficial,⁷ although the endpoints of uterine perforation or IUCD migration were examined, as the incidence was too low. Nevertheless, ultrasound remains a good practice to assure proper IUCD insertion. It also allows early identification of uterine perforation.

The presentation of recurrent urinary tract infection after IUCD insertion may suggest an intravesical migration.⁸ In our case, the patient presented with the symptoms many years after IUCD insertion. This passage

of time suggested that the intravesical migration occurred later. Her two deliveries after the IUCD insertion may substantiate the migration. In this case, there was the late diagnosis of IUCD migration when she presented with urinary symptoms after having them for months. This case highlights the importance of high suspicion when a pregnancy occurs with a prior history of IUCD insertion. A simple radiograph with or without ultrasound may be able to diagnose a migrated IUCD. If an intravesical migration is suspected, a urology referral can be made for a cystoscopy.

The literature describes multiple methods of IUCD removal via cystoscopy, laparoscopy or open surgery.^{1,9} In our case, the cystoscopy and

computed tomography revealed that the IUCD was embedded within the bladder dome. Due to the potential risk of an intraperitoneal rupture of the bladder with cystoscopic removal, we decided for an open removal.

Conclusion

When a pregnancy occurs following the insertion of an IUCD, there should be a high suspicion of uterine perforation or possible migration. A radiograph can be done in a primary health care clinic setting to search for a missing IUCD. Techniques for removal depend on the organ involved. Early referral to a subspecialty center is warranted following an initial workup.

How does this paper make a difference to general practice?

- An IUCD is commonly inserted by the primary health care physician. This case will highlight the importance of proper technique, careful insertion and the role of ultrasound.
- Awareness of IUCD migration is essential.
- When a pregnancy occurs following an insertion of an IUCD, there should be a high suspicion of uterine perforation or possible migration.
- A radiograph can be done in the primary health care clinic to search for a missing IUCD.
- Early referral to the urology service is warranted when a patient presents with recurrent urinary tract infections. Removal of an intravesical IUCD can be managed with cystoscopy, laparoscopy or open surgery.

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Caecal Volvulus after a dental procedure – not just constipation!

Ng ZQ, Tan JH , Tan HCL

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Authors:

Tan Jih Huei

(Corresponding author)

(MRCS)

Department of General Surgery
Hospital Sultanah Aminah, Jalan
Abu Bakar, Masjid Sultan Abu Bakar
80000 Johor Bahru, Johor
Malaysia.

Email: huei_87@hotmail.com

Ng Zi Qin

MBBS Hons

Department of General Surgery
St John of God Subiaco Hospital
Perth, WA, Australia

Email: kentng@hotmail.co.uk

Henry Chor Lip Tan

MD

Department of General Surgery
Faculty of Medicine, National
University of Malaysia Medical
Centre, Kuala Lumpur
Malaysia.

Email: rels1402@gmail.com

Abstract

Caecal volvulus has been reported to be associated with various abdominal and pelvic pathologies. Its signs and symptoms are usually non-specific and maybe overlooked in favour of benign causes, such as constipation. A high degree of suspicion is required for prompt diagnosis. Herein, we report on an unusual case of caecal volvulus after a dental procedure that was managed initially as constipation.

Introduction

Volvulus is the third leading cause of large bowel obstruction after bowel malignancies and diverticulitis. Any segment of the colon can be affected by volvulus; however, sigmoid is most commonly affected (60-75%), followed by the caecum (25-40%), transverse colon (1-4%) and splenic flexure (1%).¹ Various rare associations of caecal volvulus have been made with abdominal/pelvic pathologies such as bowel cancer, acute cholecystitis, abdominoplasty, pregnancy, ventral hernia, endometriosis and uterine leiomyoma.^{1,2} Herein, we present a case of large bowel obstruction from caecal volvulus which was likely precipitated by the use of an opioid for analgesia after a dental procedure, highlighting the importance of thinking out-of-the-box and

not just zeroing in on constipation. A similar condition, known as mobile right colon/caecum syndrome, is also discussed, as caecal volvulus may represent part of its spectrum.

Case Report

A 56-year-old woman presented to the hospital with lower abdominal pain and distention over the past 2 days. She described having difficulty with opening her bowels initially, and her abdominal distention was worsening gradually. Her abdominal pain was central and colicky, with no associated symptoms. There was nausea but no vomiting. She had undergone an uncomplicated dental procedure 2 days prior and was discharged home on the same day. She had been taking Paracetamol/Codeine

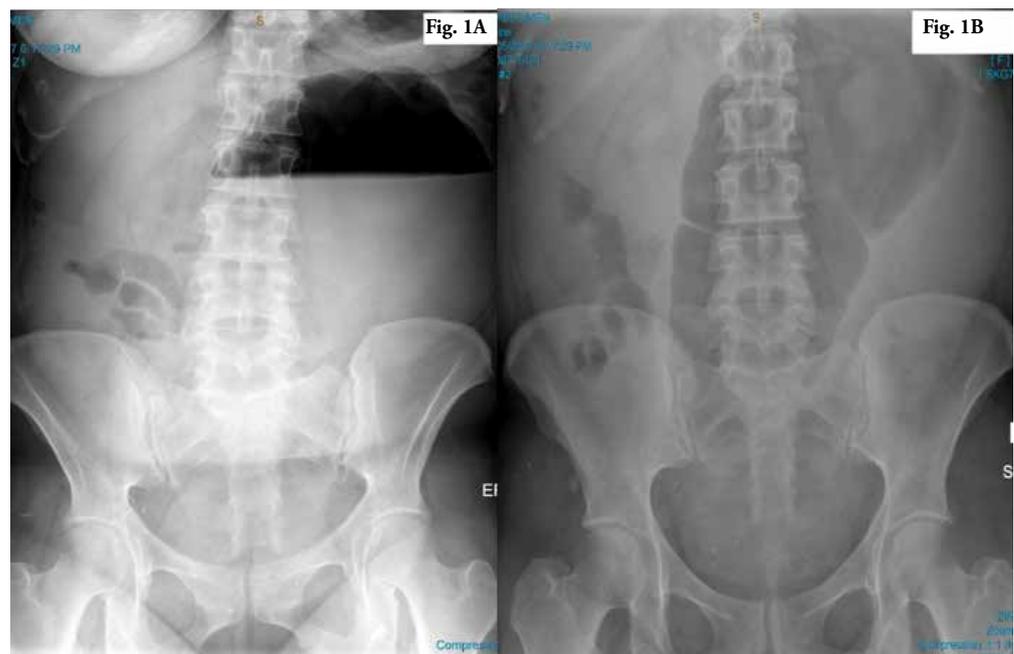


Figure 1a: Erect abdominal x-ray showing a dominant, dilated large bowel loop with air fluid level.

Figure 1b: Supine abdominal x-ray demonstrating a dilated large bowel loop from the right lower pelvis to the left upper quadrant.

500mg/30mg two tablets three times a day for pain relief. The initial medical team diagnosed her with constipation and initiated treatment with Macrogol (Movicol) and a fleet enema with minimal improvement.

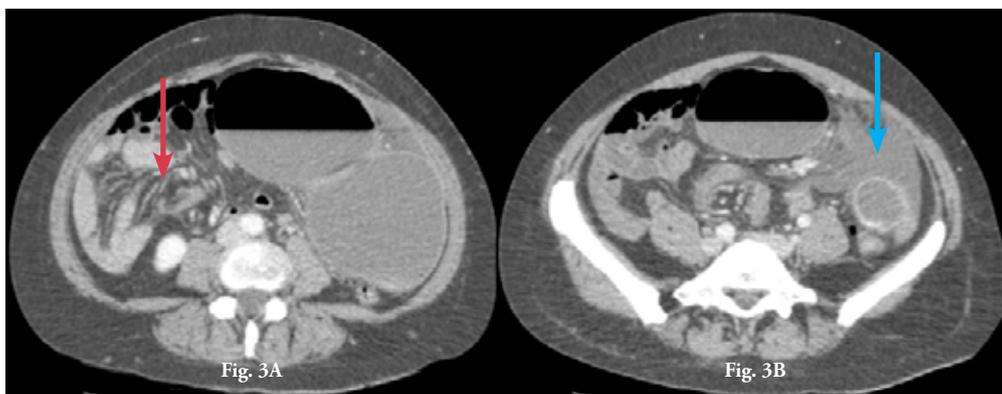
On further review of her history, it was revealed that she had been having symptoms of constipation and occasional lower abdominal cramps for the past 15 years. Her past medical history included a pyloromyotomy for pyloric stenosis and a left mastectomy with reconstruction for breast cancer 7 years ago.

The surgical team was consulted when her abdomen became more distended. On examination, her vital signs were within normal limits. Her abdomen was moderately distended but soft. There was mild tenderness around the central abdomen. The blood investigation was unremarkable, except for a mild leucocytosis of 14.6 (109/L). An abdominal x-ray (Figure 1) showed a very large, fluid-filled loop of large bowel with an air fluid level typical of a caecal volvulus. A computed tomography (CT) (Figures 2 & 3) of the abdomen/pelvis subsequently confirmed a caecal volvulus with oedematous mesentery.



Figure 2a: Coronal view of CT abdomen/pelvis demonstrating a caecal volvulus.

Figure 2b: Sagittal view of CT abdomen/pelvis showing the “whirl sign” (arrow) of the mesentery.



Figures 3a & 3b: Axial view of CT abdomen/pelvis showing the caecal volvulus with oedematous mesentery (red arrow) and free fluid (blue arrow)

A nasogastric tube was inserted and intravenous fluid was started. An emergency midline laparotomy was performed after an informed consent. Intraoperatively, there was evidence of a serosal tear of the ascending colon but no perforation, and the mesentery was noted to have features of chronic volvulus (**Figure 4**). A right hemicolectomy was performed with stapled side-to-side ileo-colic anastomosis.

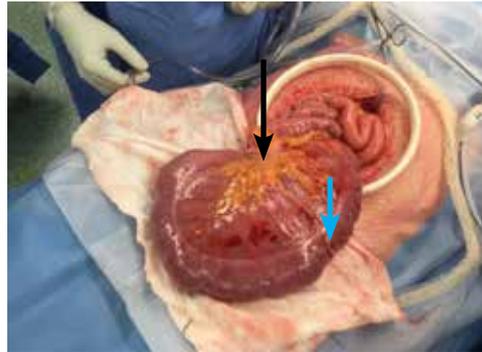


Figure 4: Intraoperative findings confirmed caecal volvulus. There was also evidence of chronicity (black arrow) and serosal tears (blue arrow).

Post-operatively, the patient recovered progressively and was discharged on day four.

Discussion

Caecal volvulus is an axial twist of the caecum, ascending colon and terminal ileum around the mesentery pedicle leading to large bowel obstruction. Caecal volvulus is less common in the Western world and is more common in younger women (<60 years of age).² Multiple theories have been put forth for its aetiology, but it is most likely multifactorial. A few risk factors have been found to be associated with its occurrence: chronic constipation, previous surgeries, pregnancy and previous colonoscopies.¹ Opioids are known to cause constipation. With the background history of chronic constipation in the current case, the use of an opioid prolongs the colonic transit time, which may have been the precipitating factor for the colonic volvulus.³ An anatomical predisposition has been noted where there is a lack of parietal fixation of the ileocaecal region during embryological counter-clockwise caecal rotation from the left side of abdomen towards the right iliac fossa.¹ As a result of the embryological predisposition, caecal volvulus maybe part of the spectrum of conditions that includes mobile right colon. In mobile right colon, there is a failure of the right colonic mesentery to fuse to the lateral peritoneum.

Caecal volvulus is known to be a challenge to diagnose, and the majority of the cases present in an emergency setting. The initial clinical features are usually vague and requires a high degree of suspicion, as demonstrated in our case. Patients may have symptoms of constipation and abdominal distention/bloating. Occasionally, nausea and vomiting may be present and should raise suspicion of a bowel obstruction. A history of intermittent abdominal pain may reveal a degree of chronicity in which the volvulus spontaneously untwists. It may also represent mobile caecum syndrome, which has very similar symptoms. On clinical examination, findings of tachycardia and fever may indicate bowel compromise. The biochemistry examination is usually unremarkable until late progression, at which time raised inflammatory markers, electrolyte derangement from dehydration and elevated lactate levels would be observed. Plain radiography is considered to be the first-line imaging investigation, where findings of caecal dilatation and/or small bowel dilatation, a dominant air-fluid level and collapse of distal colon can be expected. Nevertheless, computed tomography (CT) of the abdomen/pelvis is usually the mainstay in imaging.⁴ It helps to exclude other intra-abdominal causes and can identify caecal volvulus correctly. Valuable information, especially unusual causes, can be obtained for pre-operative planning and involve other surgical specialities, if required. Key CT findings of caecal volvulus include the “CT coffee bean,” “bird beak” and “whirl sign” (**Figure 2b**).¹ Surgical options for caecal volvulus include single-stage primary ileo-colic resection and anastomosis or a two-staged procedure with delayed ileo-colic anastomosis following a period of temporary double-barrelled stoma. Another, less invasive option is the colonoscopic decompression of the caecum, but the recurrence rate is high.^{1,4}

Our patient may have an underlying mobile caecum syndrome that has been masquerading as chronic constipation.^{5,6} The sudden use of opioids worsened her degree of constipation and led to an acute episode of caecal volvulus. The difficulty in diagnosing mobile caecum syndrome should be acknowledged. Clinical symptoms are usually non-specific, although some patients may present with intermittent right iliac fossa pain and constipation. Further, imaging tests do not usually provide additional information except in the acute setting. In carefully selected patients, a laparoscopy may offer diagnostic and therapeutic benefits (caecopexy and appendicectomy).^{6,7}

In summary, the differential diagnosis of caecal volvulus should be considered in any young female patient that presents with abdominal distension and a history of “chronic constipation.” The use of opioid-based medication may worsen

an underlying mobile caecum syndrome and precipitate an acute episode of caecal volvulus. Swift recognition of this condition is vital to prevent morbidity and mortality.

How does this paper make a difference to general practice?

1. Caecal volvulus is a rare condition but can present with vague abdominal symptoms. Reporting this case in this journal may alert the general practitioner to be vigilant when a patient presents with constipation.
2. Use of codeine-based analgesics precipitating the worsening of constipation shall require further evaluation. In a primary care setup, an abdominal radiograph is useful for such evaluation.
3. The typical findings of caecal volvulus and its definitive management are presented here. The side effects of a codeine-based analgesic are highlighted, providing the general practitioner with additional knowledge concerning this rare condition.

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A rare case of streptococcus mitis infective endocarditis complicated by heart failure in a lactating mother with recurrent breast engorgement

Hakimah S, Liyana Najwa IM, Hoo FK, Siti Zulaikha Z, Haikal Hafiz WZWZ, Tan WM

Hakimah S, Liyana Najwa IM, Hoo FK, et al. A rare case of streptococcus mitis infective Endocarditis complicated by heart failure in a lactating mother with recurrent breast engorgement. *Malays Fam Physician*. 2019;14(2):36–38.

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Authors:

Sallehuddin Hakimah

(Corresponding author)
MBBS, MRCP (UK)
Department of Medicine, Faculty of
Medicine and Health Sciences
University Putra Malaysia
Malaysia.
Email: drhakimah@upm.edu.my

Inche Mat Liyana Najwa

MBBS, MRCP (UK)
Medical Department, Faculty of
Medicine and Health Sciences
Universiti Putra Malaysia
Malaysia.

Hoo Fan Kee

MBBS, MRCP (UK)
Medical Department, Faculty of
Medicine and Health Sciences
Universiti Putra Malaysia
Malaysia.

Zakariah Siti Zulaikha

MB BCH BAO (Ire) DrPath (Mal)
Medical Microbiology and
Parasitology Department, Faculty
of Medicine and Health Sciences
Universiti Putra Malaysia
Malaysia.

Introduction

Infective endocarditis during breastfeeding is rare. To the best of the authors' knowledge, this is the second recorded case of infective endocarditis in a lactating mother. It is known that women of child-bearing age are susceptible to infective endocarditis during pregnancy when the immune system is compromised.¹ Nevertheless, past cases were also exposed to a systemic infection via milk infected by their infant's oral commensal. *Streptococcus mitis* (*S.Mitis*) endocarditis in pregnancy has also been reported, whereby a lady delivered via caesarean section and underwent mitral valve reconstruction and annuloplasty.¹ *S. mitis* is considered a pioneer streptococci commensal in human oral mucosa, appearing as early as 1-3 days after delivery.² As a child grows, their oral mucosa will be colonized by more *viridans streptococci*, including the teeth, oropharynx and nasopharynx. In a mother who breastfeeds, a crack in the nipple and breast engorgement can be predisposing factors for systemic infection stemming from an infant's oral commensal. Both cases of breastfeeding-related infective endocarditis caused by pioneer *streptococcus viridans*, *S.mitis* in our report and *S.salivarius*³ in the previous report, affected the left-sided valves.

Case report

A 32-year-old Indonesian lady, Para 1, who has been working in a factory in Malaysia for the past 11 years presented with a 1-month history of fever, chills and rigors, lethargy and a productive cough with whitish phlegm. She had delivered a healthy, full-term baby girl 8 months ago via spontaneous vaginal delivery and had been breastfeeding the baby since birth. She reported intermittent breast engorgement with fever and was treated with antibiotics at the nearest clinic. She also complained of loss of appetite and the loss of approximately

5kg in weight over the past 4 months. Her past medical history was unremarkable. A physical examination revealed clubbing and splinter hemorrhages on her fingers and toes and hepatosplenomegaly. In addition, Janeway lesions were noted on both palms and soles. A cardiovascular examination showed raised jugular venous pressure, displaced apex beat, a pansystolic murmur which was loudest at the apex and radiated to the axilla and pedal edema up to the ankles. A Lung examination revealed bi-basal crepitations. A breast examination at this point was normal with no masses, nipple discharges or skin changes. An oral examination did not reveal any dental caries or oral candidiasis. Initial laboratory investigations showed bicytopenia (thrombocytopenia and microcytic hypochromic anemia), leucocytosis and microscopic hematuria. A working diagnosis of infective endocarditis complicated by heart failure was made. She was started initially on IV Ceftriaxone 2g OD.



Figure 1

Her transthoracic echocardiogram evinced an ejection fraction of 74% and dilated left and right atriums. There was moderate tricuspid regurgitation and severe mitral regurgitation with an eccentric jet. Large and fresh sessile vegetation was seen at the posterior mitral valve leaflet (2.5x1.5cm) (yellow arrow in Figure 1).

Wan Zukiman Wan Zul Haikal Hafiz

MD, MMed (UKM)
Medical Department, Faculty of
Medicine and Health Sciences
Universiti Putra Malaysia
Malaysia.

Tan Wei Ming

MBBS
Medical Department, Hospital
Serdang, Malaysia.



Figure 2

An anteroposterior chest radiograph showed an upper lobe diversion and prominent perihilar vessels suggesting pulmonary edema. The left heart border was also straightened, suggesting a left atrial dilatation (**Figure 2**).

The blood culture taken on admission grew *Streptococcus mitis* a few days later. It was sensitive to penicillin and ampicillin but resistant to clindamycin and erythromycin and had a minimal inhibitory concentration for penicillin of 0.032 μ g/l. The antibiotic was changed immediately to IV Benzylpenicillin 3MU every 4 hours and IV Gentamicin 3mg/kg OD, according to the local national antibiotic guidelines (National Antibiotic Guideline, 2014). No growth emerged from the subsequent blood cultures. The blood film for malarial parasites and sputum for Acid-fast bacilli were both negative. Her full blood picture did not show atypical cells.

With the administration of the antibiotics, the C-reactive protein decreased from 268.9 mg/L to 137.04 mg/L (normal range: < 3.0mg/L) within 3 weeks, while the Erythrocyte Sedimentation Rate (ESR) ranged from 84mm/hr to 113mm/hr (normal range : < 11mm/hr). An electrocardiogram done throughout the admission showed no prolonged P-R interval. After 3 weeks of antibiotics, she requested a discharge at her own risk with a plan for mitral valve replacement in her home country due to logistic issues.

Discussion

This is a case of prolonged fever with signs of infection, loss of weight, loss of appetite, signs of vasculitis and hepatosplenomegaly. Apart from the unifying diagnosis of infective

endocarditis, other differential diagnoses could be pulmonary tuberculosis, myeloproliferative disease and connective tissue disease. Because the blood culture grew an organism typical of infective endocarditis, the other diagnoses were unlikely.

Streptococcus mitis (*S. mitis*) is a pioneer colonizer of the neonatal oropharynx and remains a significant commensal throughout life. In a past report of a breastfeeding mother with *S. salivarius endocarditis*, which was also the result of a viridans streptococci, it was suggested that the bacteria originated from the baby's flora and transmitted to the mother during breast engorgement.³

The pathogenesis behind *S. mitis* infective endocarditis is poorly understood. Several studies have shown that the bacteria is able to evade clearance via secretory Ig A, leading to adherence and colonization of the oral cavity. *S. mitis* then directly binds to platelets in the bloodstream as part of the pathogenesis of infective endocarditis.⁴

S. mitis has become an emerging threat for the immunocompromised, namely, neutropenic patients and the elderly.^{4,5} This patient, albeit having just given birth 8 months prior, had, as far as we knew, an intact immune system and patent native heart valves. In an immunocompetent host, *S.Mitis* has a predilection for left-sided endocarditis in non-drug addicts and right-sided endocarditis in drug addicts⁶.

The current management of infective endocarditis caused by oral streptococci, according to local guidelines and the European Society of Cardiology, remains a beta-lactam together with an aminoglycoside for a synergistic bactericidal effect and to shorten the duration of administration from 4 weeks to 2 weeks if the patient is on a beta-lactam alone.^{7,8}

Duke's Criteria was used to diagnose infective endocarditis in this patient.^{8,9} She fulfilled one major criteria, which was an oscillating intracardiac mass on the valve in the path of the regurgitant jets in an echocardiography, and four minor criteria, which were fever, vascular phenomena (Janeway lesions, splinter hemorrhages), immunologic phenomena (Osler nodes) and one positive blood culture of an organism consistent with infective endocarditis.

Conclusion

This case highlighted a rare complication of mastitis, i.e., infective endocarditis, possibly from the baby's oral commensal. Infective endocarditis during pregnancy and postpartum in Malaysia is rare, as we have effective dental screening for pregnant mothers with regular follow-up with a dentist throughout the pregnancy. However, some foreign workers and patients in rural areas attend antenatal follow-ups irregularly.

Logistic issues, financial difficulties and poor education are the main barriers to maintaining their health.

As an influx of foreign workers is recognized as a health challenge for family physicians, the authors would like to suggest that education on dental screening, family planning and personal hygiene during breastfeeding should be provided to patients encountered during pregnancy.

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Cardiac arrhythmia triggered by diuretic-induced hyponatremia

Lu HT, Loo HC, Ng KS, Wong YO, Nordin R

Lu HT, Loo HC, Ng KS, Wong YO, Nordin R. Cardiac arrhythmia triggered by diuretic-induced hyponatremia. *Malays Fam Physician*. 2019;14(2);39–43.

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Authors:

Hou Tee Lu

(Corresponding author)
MD (USM), FRCP (EDINBURGH)
Department of Cardiology, Sultanah Aminah Hospital, 8 Jalan Masjid Abu Bakar, 80100 Johor Bahru Johor, Malaysia.
luhoutee@gmail.com

Hou Chan Loo

MD (UKM), FRACGP (Australia)
MRCP (London)
Ledang Specialist Clinic, 141 Jalan Muar, 84900 Tangkak Johor, Malaysia.

Kian Seng Ng

MBBS (Singapore), MASTER OF MEDICINE IM (Singapore), FAFPM (Malaysia)
Klinik Malaysia, 118, Jalan Mersing, 86000 Kluang, Johor Malaysia.

Yin Onn Wong

MBBS (UM), AM (MAL), FRCP (Glasgow)
Klinik Pakar Perubatan Century 14A, Jalan Harimau, Century Garden 80250 Johor Bahru, Johor Malaysia.

Abstract

Diuretics have a long and distinguished history in the treatment of hypertension and heart failure. Clinical practice guidelines recommend that diuretics should be considered to be as suitable as other antihypertensive agents for the initiation and maintenance of antihypertensive treatment. However, diuretics may potentially cause electrolyte disturbances and metabolic side effects. Diuretic-induced hyponatremia is probably more prevalent than generally acknowledged. We present an unusual case of indapamide-induced hyponatremia and hypokalemia complicated by cardiac arrhythmia. The adverse drug reaction was reversible and non-life-threatening, but this case serves as a reminder that careful evaluation and constant monitoring are necessary when prescribing diuretics.

Abstract

Diuretics are among the most important drugs in our therapeutic armamentarium for treating hypertension and heart failure. Clinical practice guidelines (CPGs) recommend that diuretics should be considered to be as suitable as other antihypertensive agents for the initiation and maintenance of antihypertensive treatment.¹ Diuretics are effective and economical and commonly prescribed by doctors in clinical practice. However, the setback is that diuretics may cause electrolyte disturbances and metabolic side effects. Severe diuretic-induced hyponatremia causes debilitating symptoms, such as confusion, falls and seizures, and can sometimes be fatal. Diuretic-induced hyponatremia necessitating hospital admission has been reported in retrospective studies. We present a patient with indapamide-induced hyponatremia and hypokalemia complicated by cardiac arrhythmia.

Case presentation

A 65-year-old Chinese male with hypertension had been on a combination antihypertensive drug (telmisartan-

amlodipine 40/5 mg once daily) for about three years. Due to inadequate blood pressure (BP) control, his general practitioner changed the antihypertensive treatment to a triple drug combination pill (perindopril-indapamide-amlodipine [5/1.25/5 mg]) in a once daily dose. Ten days after switching his antihypertensive agent to perindopril-indapamide-amlodipine, he presented to the Accident & Emergency (A&E) department for generalized weakness, dizziness, palpitations and vomiting. He did not complain of tinnitus or vertigo. There was no history of fall, injury or syncopal attack. He was a smoker, non-diabetic and did not consume alcohol. He denied taking any over-the-counter drug, herbal remedies or health supplements. On examination, he was afebrile and oriented but drowsy. His pulse was 86 beat/minute (irregular), and his BP was 150/90 mmHg. There was no pallor, cyanosis or pedal edema, and the jugular venous pressure was not raised. His chest was clinically clear, and the cardiac examination was unremarkable. A neurological examination showed no ataxia or focal neurological deficit. The electrocardiography (ECG) showed frequent premature atrial contractions (PACs). (Figure 1A).

Rusli Bin Nordin

MD (Monash, Australia), MPH, PhD (Japan)
 Clinical School Johor Bahru
 Jeffrey Cheah School of Medicine and Health Sciences, Monash University Malaysia, 8 Jalan Masjid Abu Bakar, 80100 Johor Bahru Johor, Malaysia.



Figure (1A) ECG on admission. The non-sinus P wave in PACs occurs earlier than the expected sinus P wave and has a different morphology, such as notched, flattened, negative (retrograde), or may occur on the preceding T wave (hidden). In our case, a representative PAC is shown in the lead aVF (arrowhead), displaying 4 consecutive normal sinus P waves with normal QRS complexes, followed by a PAC with its P wave hidden in the preceding T wave. The PACs have narrow QRS complexes. The compensatory pause following the PACs resume exactly two P-P intervals after the last normal sinus beat (as illustrated in lead II) (1B) Normalization of ECG one week later. PACs, premature atrial contractions; P-P interval, time interval between two consecutive sinus P waves.

The serum Troponin T test (quantitative method) was negative. The chest X-ray showed mild cardiomegaly with a cardio-thoracic ratio of 60%. The blood investigations at admission revealed serum sodium of 115 mmol/L (hyponatremia) and potassium of 3.5 mmol/L (hypokalemia). The full blood count, liver function test, lipid profile, and thyroid hormone profile were normal (Table 1).

Table 1. Blood investigation on admission and follow-up

Blood investigation	On admission	On follow-up*	Normal limits
<i>Full blood count</i>			
Hemoglobin	15.2	-	13.0 – 17.0 g/dL
White cell count	9.2	-	4.0 – 11 x 10 ³ /μL
Platelets	314	-	150 – 400 x 10 ³ /μL

Blood investigation	On admission	On follow-up*	Normal limits
<i>Renal function test</i>			
Sodium	115	132	135 – 152 mmol/L
Potassium	3.5	4.7	3.6 – 5.4 mmol/L
Urea	3.1	3.5	2.3 – 6.8 mmol/L
Creatinine	66	69	60 – 130 µmol/L
Random blood glucose	8.3	-	4.0 – 7.8 mmol/L
<i>Liver function test</i>			
Alanine aminotransferase	33	-	5 – 55 IU
Aspartate aminotransferase	33	-	8 – 40 IU
<i>Lipid profile</i>			
Total cholesterol	5.4	-	<5.5 mmol/L
Triglycerides	1.09	-	0.40 – 1.54 mmol/L
HDL cholesterol	1.97	-	0.75 – 1.73 mmol/L
LDL cholesterol	2.9	-	< 3.4 mmol/L
<i>Thyroid function</i>			
FreeT4	21.4	-	10.0 – 28.2 pmol/L

*One week after discharge from an acute admission to the A&E department

The hyponatremia was treated by intravenous normal saline (0.9%) infusion. The patient was monitored as an inpatient in the A&E department for three hours. His symptoms improved after one pint of normal saline infusion. We recommended admission for further treatment and monitoring of cardiac arrhythmia. However, the patient discharged himself against advice. One week after discontinuation of perindopril-indapamide-amlodipine, the repeat serum sodium had increased to 132 mmol/L at follow-up. The serum potassium was corrected to 4.7 mmol/L. The patient was oriented, and his symptoms had resolved completely. The repeat ECG showed normal sinus rhythm (**Figure 1B**). The transthoracic echocardiography revealed an ejection fraction of 75 % with normal valves, normal wall motions and no visible mass or thrombus. Subsequently, the results of the 24-hour Holter monitor and exercise stress test were normal.

Discussion

We present a hypertensive patient presenting with indapamide-induced hyponatremia and hypokalemia complicated by cardiac arrhythmia. The patient did not have any known prior cardiac disease. After the cessation of the diuretic, the electrolyte imbalance was normalized, and the cardiac arrhythmia was no longer present. Kottwitz et

al. reported a case of hyponatremia associated with hydrochlorothiazide and amiloride in which the patient presented with a complete heart block.² Mouallem et al. described three patients with atrioventricular (AV) conduction defects, all of which occurred after episodes of severe hyponatremia. Diuretic-induced hyponatremia was observed in two patients. The findings suggest that hyponatremia may play a role in the pathogenesis of the observed AV conduction defects, but the association between cardiac conduction defects and hyponatremia is far from established.³ To our knowledge, PACs associated with hyponatremia has not been reported in the literature. PACs, also known as atrial premature complexes, are a common cardiac arrhythmia occurring both among healthy individuals and those with significant heart disease.

As the P wave in PACs originates outside of the sinoatrial (SA) node, the P wave morphology is different from the normal sinus P wave and occurs earlier than the expected sinus P wave. The non-sinus P wave in PACs can be notched, flattened, negative (retrograde), or may occur on the preceding T wave (hidden) if it is discharged very early. In PACs, the QRS complex is normal, whereas PVC has a wide QRS complex.

PACs have been considered a benign electrophysiological phenomenon that rarely

results in serious clinical consequences. The etiology of PACs include increased sympathetic activity as a result of pain or anxiety, atrial distention, atrial ischemia or infarction and pericarditis.⁴ PACs seldom require treatment beyond removal of the precipitating factor or treatment of the underlying disease.

However, Marcus et al. has described a PAC as a “wolf in sheep’s clothing.”⁵ This is because a high PACs burden may be a forerunner of atrial fibrillation/flutter, which is associated with a higher risk of stroke and death. In our patient, the PACs associated with diuretic-induced hyponatremia were non-life-threatening. It must be emphasized, however, that older or sicker patients with co-existing comorbidities may not tolerate hyponatremia. The CPGs recommend that diuretics should be considered to be suitable as beta-blockers, calcium-channel blockers, angiotension-converting-enzyme inhibitors and angiotensin receptor blockers for the initiation and maintenance of antihypertensive treatment.¹ The efficacy, safety and tolerability of diuretics have been evaluated in randomized-controlled trials. However, diuretic-induced hyponatremia is probably more prevalent than generally acknowledged. Severe diuretic-induced hyponatremia causes debilitating symptoms, such as confusion, falls and seizures, and can sometimes be fatal.⁶ Hyponatremia is one of the major adverse effects of thiazide and thiazide-like diuretics and is the leading cause of drug-induced hyponatremia requiring hospitalization. Indapamide is a non-thiazide diuretic, and its mechanism of action is similar to that of thiazide-diuretics. Between 1984 and 2000 in Australia, 84 cases of hyponatremia and 87 reports of hypokalemia, in which indapamide was the sole suspected drug, were submitted to the Adverse Drug Reactions Advisory Committee.⁷ Most cases involved elderly patients, and most reports involved an indapamide dose of 2.5 mg daily. In another retrospective study, eleven patients were admitted to a tertiary hospital between 2006 and 2009 with severe indapamide-related hyponatremia (defined as serum sodium < 125 mmol/L).⁸ All patients were female and elderly (age: 81.7 ± 5.8 years). A dose

of indapamide sustained-release 1.5 mg was taken daily by eight of the eleven patients. The other three patients took indapamide 2.5 mg in combination with perindopril. Increasing the use of diuretics will expose more patients to the risk of hyponatremia. Age-related changes in pharmacokinetics and pharmacodynamics make the elderly vulnerable to the development of adverse drug reactions. Drug-disease interactions or drug-drug interactions may occur because polypharmacy is more common in the older population. In patients on diuretics, especially the elderly, changes in conscious or mental states should prompt timely measurement of the serum sodium concentration. Diuretic-induced hyponatremia necessitating hospital admission is common enough to suggest that current monitoring regimens are suboptimal.⁹ Clinicians should be aware of the severe electrolyte disturbance arising from diuretics, and patients should be informed of the common manifestations of an adverse reaction.

Conclusion

Diuretic-induced hyponatremia is an important cause of preventable morbidity. Therefore, special attention should be given to its prevention. The adverse drug reaction in our case was non-life-threatening but serves as a reminder that careful evaluation and constant monitoring are necessary when prescribing diuretics.

Consent

Written informed consent was obtained from the patient for publication of this manuscript and the accompanying images.

Conflict of interest

The authors declare that there are no conflicts of interest.

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How does this paper make a difference to general practice?

1. Clinicians should be aware of the severe electrolyte disturbances which can arise from the use of diuretics.
2. Patients should be instructed about the common manifestations of adverse effects. A new onset of symptoms, such as lethargy, generalized weakness and dizziness, should prompt evaluation of the electrolyte profile.
3. In the elderly population, where polypharmacy and the presence of co-morbidities are common, there is increased vulnerability to diuretic-induced hyponatraemia.
4. When a diuretic is indicated, special attention should be given to the prevention of adverse side effects, and the patient should be monitored closely.
5. Concomitant use of a potassium supplement is indicated when hypokalemia is detected during the use of diuretics.

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TEST YOUR KNOWLEDGE

A child with elbow pain

Mat Yudin Z, Wan Ahmed WA, Chanmekun SB

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Authors:

Zainab Mat Yudin@Badrin

(Corresponding author)

School Of Dental Sciences, Universiti

Sains Malaysia, Health Campus

16150 Kubang Kerian, Kelantan.

Email: drzainab@usm.my

Wan Aireene Wan Ahmed

Department of Radiology

School Of Medical Sciences Universiti

Sains Malaysia, 16150 Kubang

Kerian, Kelantan.

Siti Balqis Chanmekun

Department of Family Medicine

Universiti Sains Malaysia

16150 Kubang Kerian, Kelantan.

Abstract

Elbow injuries are common in children. Supracondylar fractures occurred in 16% of all pediatric fractures. Supracondylar fractures can be classified into 4 types according to the Gartland classification, depending on the degree of the fracture present in the lateral radiograph. This case highlights the case of a child with a Gartland Type I fracture. A misdiagnosis of this fracture will compromise the management of the injury with regards to immobilization and subsequent care. As this injury can be managed on an outpatient basis, primary care frontliners need to be aware of the condition.

Case History

3-year old boy presented to the outpatient clinic with left elbow pain and swelling after a fall. He fell on his left arm when it was in the outstretched position. He complained of pain, especially during movement, and developed mild swelling at the elbow. He also denied any changes in sensation in the left arm or hand (such as numbness or tingling).

The examination of the left arm showed tenderness and swelling at the elbow but no bruises. The range of movement could not be elicited because the child refused to move the arm. However, he was able to move his distal fingers. The left radial pulse was palpable and had good volume. The skin color and temperature were normal.

Radiographs of the left distal humerus with anteriorposterior (AP) and lateral views were performed (**Images 1 and 2**).



Image 1



Image 1

Questions

- 1 Describe the radiological findings in Images 1 and 2.
2. What is the diagnosis?
3. Outline the management for this patient.

Answers

1. There is the presence of a posterior fat pad (lateral view) with minimal cortical disruption (buckling) of the medial surface of the left supracondylar (AP view). The fat pad is a visualization of a lucent crescent of fat located in the olecranon fossa in a true lateral view of the elbow joint.¹ An anterior fat pad can present in a normal radiograph. However, the posterior fat pad is usually pathological, indicating an elbow joint effusion. It can be a clue pointing to occult nondisplaced fractures, in particular, a supracondylar fracture in children.
2. The diagnosis is a left supracondylar fracture of Gartland Type I. The Gartland classification is based on the lateral radiograph. Gartland Type I fractures are nondisplaced, Type II fractures are displaced with angulation, and Type III fractures are completely displaced and lack cortical contact while maintaining an intact posterior cortex.² Supracondylar fractures occurred in 16% of all pediatric fractures.³ The peak age for supracondylar fractures is between 6 and 7 years of age.⁴ In this age range, the area is prone to fracture because it is undergoing remodeling and typically thinner with a more slender cortex. Proper assessment of clinical presentation and radiographic features is important
3. The affected elbow should be supported and immobilized at a flex of about 30 degrees with the other hand, a triangular bandage sling or any other form of splintage before sending for radiographic evaluation to prevent further neurovascular injury and also to reduce pain. This child needs an above-elbow cast at 90 degrees of flexion for 3 to 4 weeks.⁵ If a backslab is applied, it should be extended as high above the elbow as possible (i.e., close to the axilla) and down to the MCP joints.⁶ The application of a comfortable, well-padded, and appropriately applied splint is a critical part of the initial management of these injuries, regardless of their definitive treatment. This child can be given an oral analgesia (e.g., ibuprofen 5mg/kg, paracetamol 15mg/kg or Codeine 1 mg/kg every 4–6 hours) for mild to moderate pain relief.⁷ The parent(s) should be advised regarding the elevation of the affected limb and encouraged to monitor the child's condition frequently, including monitoring changes in pain level, finger movement and sensation. The child also needs to be encouraged to perform finger exercises to prevent stiffness and promoting circulation.

How does this paper make a difference to general practice?

- Elbow injuries are common in children and range in severity.
- A subtle injury can be missed in a radiograph if the radiograph is not evaluated carefully.
- Recognition of a Gartland Type I elbow fracture will change the management plan in terms of the duration of immobilization and care.
- A Gartland Type I elbow fracture can be managed in a primary care clinic.

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A boy with peri-oral lesion

Mohamad I, Wan Ghazali WS, Mohd AW

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Authors:

Irfan Mohamad

(Corresponding author)

MD (USM), M.Med (ORL-HNS)

Department of otorhinolaryngology-
Head & Neck Surgery, School of
Medical Sciences, Universiti Sains
Malaysia Health Campus, 16150
Kota Bharu, Kelantan, Malaysia.
Email: irfanb@usm.my

Wan Syamimee Wan Ghazali

MBChB (Leicester), M.Med (Internal
Medicine)

Department of Medicine, School
of Medical Sciences, Universiti
Sains Malaysia 16150 Kota Bharu
Kelantan, Malaysia. Universiti Sains
Malaysia Health campus, 16150
Kota Bharu, Kelantan, Malaysia.

Abdul Wahab Mohd

MD (USM)

Klinik Nik Azam, Jalan JKR, 17000
Pasir Mas, Kelantan, Malaysia.

Case summary

A 4-year-old boy complained of dryness of lips for a 3-month duration. The dryness progressed to becoming scaly and painful, and lesions extended beyond the lip area. The condition was associated with peri-oral itchiness. The boy was observed to be licking his lips subconsciously a few times per minute. The lesions started with a habitual licking of the lips. There was no history of allergies or any recent intake of a new drug. There was also no history of atopy in the patient or his family.



Questions

1. What is the diagnosis?
2. What is the underlying cause?
3. State the differential diagnoses.
4. Outline the treatment.

Answers

1. The most likely diagnosis is peri-oral dermatitis. In this case, it is due to the lip-licking habit. It is characterized by a burning sensation around the mouth. This 4-year-old boy was described as having dryness over the area. The skin may appear dry, bumpy or scaly.

Similar lesions may appear around the eyes, nose or forehead, usually after the use of a topical steroid. The diagnosis is clinical, and no specific test is required.

2. The underlying cause is repetitive or prolonged contact with saliva.¹ Repeated licking may also occur with lip chewing, thumb sucking or excessive drooling. Wind instrument players may also experience lip licker's dermatitis.

A psychological disorder, such as compulsive lip licking, may cause lip-licking dermatitis. The temptation to repeatedly lick one's lips may result from continuous and persistent breathing through the mouth.

Whenever there is prolonged contact of saliva with the skin, maceration occurs, which subsequently removes the protective oils secreted by the skin's sebaceous glands.² Other known triggers include bacterial or fungal infections, fluoridated toothpaste, rosacea, oral contraceptives, and sunscreen.

3. The differential diagnosis includes herpes labialis. A specific drug eruption that is secondary to an allergic reaction can manifest as peri-oral lesions as well.³ Other differential diagnoses are peri-orificial dermatitis, steroid-induced rosacea-like dermatitis, and allergic contact dermatitis.
4. Withdrawal of the triggering factors is the most important step. An identified medication can be stopped or replaced. Habitual lip licking should be treated with psychotherapy or behavior therapy. A lip emollient may prevent the patient from licking. Oral steroids for five to seven days along with elomet ointment can reduce the inflammation. Alternatively, a topical calcineurin inhibitor, such as pimecrolimus cream, can be used for mild to moderate steroid-induced peri-oral dermatitis in children older than 2 years old, adolescents and adults.⁴ Infected lesions, after confirmation with a skin culture test, should be treated with specific antimicrobials.

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A case report “Chest discomfort in a patient with dengue – is it an acute myocardial infarction?”

Lu HT

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Authors:

Hou Tee Lu

(Corresponding author)

MD (USM), FRCP (EDINBURGH)

Department of Cardiology, Sultanah

Aminah Hospital, 8 Jalan Masjid

Abu Bakar, 80100 Johor Bahru,

Johor, Malaysia.

luhoutee@gmail.com

Dear Editor-in-Chief

I read with great pleasure the recently published case report by Koh KC et al. in the *Malaysian Family Physician*, Volume 13, Issue 2, 2018. The authors have reported on an interesting case of Dengue myocarditis mimicking an acute myocardial infarction (MI). I would like to congratulate the authors on their great job in writing this case report.

However, there are a few important points that need to be clarified. First, Dengue myocarditis mimicking acute coronary syndrome (ACS) has been reported in the literature.^{1,2,3} Among the three cases reported, two are from Singapore, and one is from Thailand. These patients were much younger than the current patient at presentation (ages ranged from 13 to 33 years old versus 56 for the current patient), and all of these patients had no coronary risk factors.^{1,2,3} In the absence of coronary risk factors, I certainly agree that the most plausible explanation for the ECG and biomarker changes is Dengue myocarditis. However, it is also sensible to consider the possibility of silent ischemia in a post-menopausal woman. For this patient, I think Dengue myocarditis is a diagnosis of exclusion. It is of great importance to exclude coronary ischemia in an older patient with the symptoms, signs, ECG changes and biomarkers suggestive of ACS, either through a non-invasive imaging study (e.g., myocardial perfusion scan) or coronary angiography.

Second, I would like to emphasize that cardiac magnetic resonance (CMR) with myocardial contrast delayed enhancement sequences is a useful, noninvasive imaging test which can differentiate myocarditis from MI.⁴ In myocarditis, the most typical finding is a subepicardial late gadolinium enhancement (LGE), sparing the subendocardium. In acute MI, LGE typically exhibits a subendocardial or transmural enhancement, and the edema is localized to the territory of the culprit vessel. Nonetheless, the main drawback of CMR is its high cost, and the test is not readily available.

Third, the authors described the patient's clinical signs of heart failure at presentation, including tachycardia, raised jugular venous pressure, crepitations at lung bases and pedal edema. Nevertheless, the clinical diagnosis of heart failure was not supported by the echocardiographic findings, i.e., a normal ejection fraction (60%). One possibility for such a presentation could be a diastolic dysfunction, but it was not described in the echocardiography report.

Conflict of interest: None

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