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- *Knowledge of and attitudes towards menstrual disorders among adults*
- *Effectiveness of pictorial health warning on cigarette packages*
- *Roles of primary care physicians in managing bipolar disorders*

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CONTENTS

EDITORIAL

Let's address sensitive issues head-on: health, gender and religion

Ng CJ

Editor-in-Chief

In this issue of MFP, an article by Nor Asyikin Y, et al on the knowledge and attitudes towards menstruation and menstrual disorders highlights the challenges primary care doctors face in our day-to-day practice;[1] a common health issue that is considered 'sensitive' and hence, rarely discussed.

Menstruation is a normal physiological process experienced by women since menarche; however, there is a variation in how it affects individual woman. As primary care doctors, we tend to manage the physical aspect of the condition, often ignoring its impact on women's emotion, relationships and religious practice.

In this study, which was conducted in Kelantan in 2012, the authors surveyed premarital couples and found that, not surprisingly, women had more knowledge of and positive attitudes towards menstrual conditions compared to men. However, both men and women were equally unaware when menstruation becomes abnormal. In addition, more than half of the women participants were 'reluctant to ask regarding menstrual disorders from the healthcare providers'. This is worrying. Do women normalise menstrual problems and suffer in silence? Do they face stigma if they discuss their menstrual problem with others? Or is it us, the healthcare providers, are shying away from advising how women can handle menstrual conditions, perhaps because we are not adequately trained? These are issues to be explored and addressed in future research.

Another important issue that was raised in this article is the role of partners in women's health. Studies have found that partners are instrumental in improving men's health-seeking behaviour.[2] For example, wives play an important role in encouraging men to go for screening.[3] In some cultural contexts, where men is the decision maker in the family, husbands or fathers may influence women's decision whether or not to seek health care.[4] It is therefore important to engage men in women's health research so that healthcare providers are aware of these gender issues in health. In this study, where men lacked knowledge and were 'not comfortable to discuss menstrual disorders with my partners', there is a role for educating the male partners and premarital classes, where this study was conducted, are ideal to do this.

In Malaysia, religion has always been a sensitive issue; a raw nerve that we avoid touching. Yet, it is exactly the sensitivity of the religious issue that we must tackle head-on, including in health care. 'Sensitive' issues, such as teenage pregnancy, abortion and sexual orientation, challenge our religious beliefs and confront us at some stage of our clinical practice. How do we deal with these personal dilemmas while maintaining our professionalism? It is difficult. I believe the way forward is for us to accept that there is no absolute right or wrong in these matters, and we must be willing to recognise and respect these differences. Unless we can accept this as the bottom line, we may risk imposing our values, including religious beliefs, onto patients. It is from this study that I learn about 'Istihadah' and the Islamic perspective to menstruation, including how women and their partners should handle it. I hope this article will help the non-Muslim readers to look at health issues from the Islamic perspective. This, I am sure, will make us a better primary care doctor.

I would like to take this opportunity to bid farewell to all of you as the Editor in Chief of the Malaysian Family Physician. It has been a rewarding four years and I thank you for all the contributions and support. Associate Professor Dr Liew Su May will take over the position from the next issue. I have no doubt she will take MFP to greater heights and continue to use it as a platform to update primary care doctors on the latest clinical evidence and professional issues that we face in our daily practice.

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ORIGINAL ARTICLE

Knowledge of and attitudes towards of menstrual disorders adults in north-eastern state of Peninsular Malaysia

Nor Asyikin Y, Nani D, Nor Azwany Y, Shamsul Kamal A, Imran A, Shaiful Bahari I, Rosediani M.

Nor Asyikin Y, Nani D, Nor Azwany Y, et al. Knowledge of and attitudes towards menstrual disorders adults in north-eastern state of Peninsular Malaysia. *Malays Fam Physician*. 2015;10(3):2-10.

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Attitude, knowledge, menstrual disorder, premarital women

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Abstract

Introduction: In Malaysia, the prevalence of menstrual disorders among adolescents and young adults is high. However, most of them are not aware of the signs and symptoms of menstrual disorders in terms of medical issue as well as Islamic ruling. Awareness of the menstrual disorder symptoms is important so that early and appropriate treatment can be given.

Objectives: The objective of the study was to compare the knowledge and attitude of premarital men and women on menstrual disorders.

Methods: This was a comparative cross sectional study conducted in Kota Bharu, Kelantan. Self-administered questionnaires were given for data collection. The questionnaires consisted of 3 parts that required information on the women's and men's socio-demographic data, women's menstrual history and information in knowledge and attitude of men and women on menstrual disorders.

Results: A total of 460 respondents were involved in this study with a response rate of 93.5%. The prevalence of good knowledge was higher among women compared to men with 73.2% and 26.8%, respectively. There was a significant difference on knowledge and attitude on menstrual disorders between premarital men and women.

Conclusion: Both premarital men and women had low knowledge on menstrual disorder with men knowing less than the women.

Introduction

Menstrual disorders are common among adolescents and reproductive-aged women. Previous studies on menstrual disorders among teenagers and young women, including in Malaysia, have revealed high prevalence, especially in premenstrual syndrome up to 96%, followed by dysmenorrhoea 94%, heavy bleeding 47.0%, irregular bleeding, oligomenorrhoea and amenorrhoea up to 18%.[1-7]

Menstrual disorders are reported to be the cause of school absenteeism among adolescents and work stress, especially among young adults. Sufferers of menstrual disorders are at risk of the exacerbation of certain medical conditions, such as acne, asthma, migraine, anxiety, eating disorders and other mental health problems.[4,8-11] Women with menstrual problem might also face life threatening conditions, such as bleeding disorder, pregnancy complications, and gynaecological cancers.[12] These indicate the need for further medical assessment and assistance at some point in their lives.

Despite the seriousness of these consequences, many teens and young adult women fail to seek help due to the lack of knowledge. Houston et al. (2006) showed that only 2% of women reported of receiving information regarding menstruation from their healthcare providers.[1] A study among Hong Kong adolescents showed that a significant number of them have poor understanding of the menstrual cycle.[9] In fact, 66.9% of those who believed that their menstrual cycle was abnormal actually had normal cycle length. On the other hand, among those who believed that their menstrual cycle was normal, 3.7% adolescents had short menstrual cycle and 3.2% adolescents had long menstrual cycles; and a further 2.8% had

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cycles of >45 days.[9] These findings suggest that both young girls, as well as their parents, have difficulty in assessing what constitutes normal menstrual cycles or patterns of bleeding. Tangchai et al. (2004) revealed that only a few of the first and second year university students knew that mefenamic acid and ibuprofen are an effective treatment for dysmenorrhoea.[13]

Research on knowledge, attitude and menstrual experience is necessary for women's health. Based on a menstrual attitude questionnaire by McPherson (2004), a comprehensive menstruation preparation with positive menarcheal experience is related to a more positive adult menstrual attitudes, experiences and behaviours and vice versa.[12]

Studies on menstruation and menstrual disorders are mainly confined to female adolescents.[1-3] Our team, on the other hand, believes that menstrual disorders also affect the male population indirectly. Thus, men are also included in this study as their dynamic relationship with their wives, daughters and mothers in terms of menstrual experience is significant, but are often overlooked. In a marital relationship, especially in the Malay culture, the men hold the role as the head of the family and should support the family not only financially but also emotionally. However, when understanding is lacking, frustration sets in men and they may go to the extent of seeking extramarital affairs. The Department of Islamic Development Malaysia has reported an increase in divorce cases with 20,259 cases in 2007.[14] Therefore, we would like to assess how much men really know and are aware of menstrual disorders in women. More specifically, this study was conducted to look at the level of knowledge and attitude on menstrual disorders among premarital couples, men and women as part of their preparation before embarking on family life.

Methods

This cross-sectional study was conducted among Muslim women and men who attended the compulsory premarital course held from January 2012 to June 2012 in the North-East state of Peninsular Malaysia. Data were collected for 10 premarital courses at the Islamic centre, Lundang Kota Bharu within a 6-month period. Premarital course participants were 18 to 40 years' old. Illiterate participants were excluded as this study used self-administered questionnaire. Systematic random sampling 1 in 2 was used to select 460 eligible participants from the registration course list.

The questionnaire was developed in a few stages. The first stage involved literature search on the topics of knowledge and attitude followed by creating each question and item. The questionnaire was then divided into two components, which were knowledge (51 items) and attitude (10 items). The knowledge component covered general knowledge on menstruation (8 items), symptoms (12 items), causes of menstrual disorders (19 items) and Islamic ruling on menstrual disorders (12 items).

Content validity was carried out by a group of experts consisting of an obstetric and gynaecologist, two family medicine specialists, a medical statistician expert in questionnaire development and validation and an Islamic religious teacher. The face validity of the self-administered questionnaire was tested on 10 premarital men and women who attended the earlier premarital course. The Cronbach's alpha was used to verify the face and content validity of the questionnaire. The coefficients obtained for the knowledge component ranged from 0.708 to 0.895 while for the attitude component, coefficients ranged from 0.600 to 0.824.

Three point Likert scale was used for all knowledge domain (Correct/Incorrect/Not sure). The response was scored as '1' for 'correct' response and 0 for 'incorrect' and 'not sure' response. Reversed scoring was done for negative knowledge item.

Attitude component contained 10 items with 5-Likert scale response (Strongly agree/Agree/Neutral/Disagree/Strongly disagree). The following scoring was used, for positive attitude item, scores of '4', '3', '2' '1' and '0' for 'strongly agree', 'agree', 'neutral', 'disagree' and 'strongly disagree', respectively. Respondents who answered 'agree' and 'strongly agree' for positive item and 'disagree' or 'strongly disagree' for negative items in the attitude domain were considered to have positive attitude. The scoring was reversed for negative attitude items. Initially 5-Likert scale response was used to look at the pattern of answers and to discriminate the extreme answers. However, in this study there was no specific pattern of answering and no extreme answers. Thus, for analysis response of similar direction were combined (strongly agree/agree as agree, neutral as neutral, disagree/strongly disagree as disagree).

The total score for each subdomain and domain was computed by summing up the relevant item scores. Then, each subdomain and domain total score was transformed to percentages for better clarity by dividing the score with the possible maximum score and multiplied by 100. The score for knowledge was then categorised into good and poor knowledge level using the agreed cut-off point of 53%. This cut-off point was based on consensus of the expert's opinion, which takes into consideration that there are 27 important questions out of 51 questions that must be answered correctly to be classified as good knowledge. Those who scored less than the cut-off point were considered to have poor knowledge. For the attitude score, the determination of good or poor, experts agreed on 80% as the cut-off point as good attitude.

The participants were briefed on the study before consent was sought out. The self-administered questionnaire was distributed to both male and female participants without identifying their partner specifically. Research team members were available to clarify any items whenever necessary. The research proposal was approved by the Human Research and Ethics Committee, Universiti Sains Malaysia on December 2011.

Results

A total of 460 participants were given questionnaires with equal numbers of men and women. The response rate was 93.5% with 430 respondents completing the questionnaires, with 202 being men and 228 women.

Most of the respondents were young adult with mean age of 24.05±4.30 years and 67.7% were employed. Majority of the respondents had obtained secondary and higher education. The mothers were reported as the main source of menstruation information (Table 1).

Table 1. Socio-demographic characteristics of male and female respondents

Variable	Women *n* (%), *n* = 228	Men *n* (%), *n* = 202	Total *n* (%), *n* = 430
Race			
Malay	227 (99.6)	200 (99.0)	427 (99.3)
Non-Malay	1 (0.4)	2 (1.0)	3 (0.7)
Age			
18–24 years old	164 (71.9)	103 (51.0)	267 (62.1)
≥25 years	64 (28.1)	99 (49.0)	163 (37.9)
Education			
Primary	12 (5.3)	39 (19.3)	51 (11.9)
Secondary	133 (58.3)	112 (55.4)	245 (57.0)
Tertiary	83 (36.4)	51 (25.2)	134 (31.2)
Stream of education			
Science	57 (25.0)	61 (30.2)	118 (27.4)
Art	155 (68.0)	100 (49.5)	255 (59.3)
Islamic	16 (7.0)	41 (20.3)	57 (13.3)
Working status			
Working	119 (52.2)	172 (85.1)	291 (67.7)
Not working	109 (47.8)	30 (14.9)	139 (32.3)
Information source regarding menstruation			
Mother/sister	144 (63.2)	81 (40.1)	225 (52.3)
Friends/school	58 (25.4)	91 (45.0)	149 (34.7)
Mass media	26 (11.4)	30 (14.9)	56 (13.0)

Knowledge and attitute on menstrual disorder

The proportion of good knowledge among women was 73.2%, which was higher than men (26.8%). There was a significant difference of mean score between men and women for the subdomain of general and symptoms of menstrual disorder (Table 2).

Respondents from both genders had high knowledge percentage score for general knowledge on menstrual disorder. However, domain causes of menstrual disorders had the lowest percentage score followed by Islamic ruling on menstrual disorder. Generally, men had a significantly lower knowledge score compared to women except for causes on menstrual disorders and knowledge on Islamic ruling (Table 3).

Table 4 shows in detail the percentage of the respondents' score on knowledge items on menstrual disorder among premarital men and women in Kota Bharu, Kelantan.

Table 2. Comparison of knowledge on menstrual disorder between premarital men and women

Variable	Knowledge *n* (%)		X^2 (df)	*P*-value
	Good	Poor		
Men (*n* = 202)	11 (26.8)	191 (49.1)		
Women (*n* = 228)	30 (73.2)	198 (50.9)	7.386 (1)	0.007*

**Chi square test, p<0.05 set as significant at 95% CI*

Table 3. Comparison of knowledge between premartial men and women score on each domain of knowledge on menstrual disorder

Domains of knowledge on menstrual disorder	Knowledge percentage score		*P*-value[a]
	Women (*n* = 228)	Men (*n* = 202)	
	Mean (SD)	Mean (SD)	
General knowledge on menstruation	70.56 (18.9)	49.75 (27.1)	<0.001
Symptoms on menstrual disorder	51.64 (21.1)	38.94 (28.0)	<0.001
Causes on menstrual disorder	27.33 (18.7)	21.65 (21.0)	0.061
Islamic ruling	34.50 (22.4)	21.03 (21.2)	0.11

SD, Standard deviation

[a]Independent t test

Table 4. The respondents' score on knowledge items on menstrual disorder among premarital men and women in Kota Bharu, Kelantan

Items	Women (*n* = %)			Men (*n* = %)		
	Correct answer	Not sure	Incorrect answer	Correct answer	Not sure	Incorrect answer
General knowledge on menstrual cycle						
Average age of menarche is 12 years old[a]	182 (79.8)	32 (14.0)	14 (6.1)	141 (69.8)	53 (26.2)	8 (4.0)
Normal length of menstrual cycle is 28 days[a]	116 (50.9)	61 (26.8)	51 (22.4)	61 (30.2)	97 (48.0)	44 (21.8)
Secondary sexual characteristic						
Breast development[a]	210 (92.1)	17 (7.5)	1 (0.4)	130 (64.4)	64 (31.7)	8 (4.0)
Axillary hair growth[a]	182 (79.8)	37 (16.2)	9 (3.9)	103 (51.0)	84 (41.6)	15 (7.4)
First menstruation[a]	178 (78.1)	31 (13.6)	19 (8.3)	148 (73.3)	49 (24.3)	5 (2.5)
Pubic hair growth[a]	197 (86.4)	24 (10.5)	7 (3.1)	117 (57.9)	74 (36.6)	11 (5.4)

Table 4. The respondents' score on knowledge items on menstrual disorder among premarital men and women in Kota Bharu, Kelantan (Continued)

Items	Women (*n* = %)			Men (*n* = %)		
	Correct answer	Not sure	Incorrect answer	Correct answer	Not sure	Incorrect answer
Normal menstrual blood characteristics						
Dark red blood[a]	186 (81.6)	31 (13.6)	11 (4.8)	89 (44.1)	107 (53.0)	6 (3.0)
Smelly blood[b]	34 (14.9)	59 (25.9)	135 (59.2)	15 (7.4)	114 (56.4)	73 (36.1)
Knowledge on Symptoms of menstrual disorder						
PMS (premenstrual syndrome)						
PMS lasted few days after menstruation[a]	90 (39.5)	120 (52.6)	18 (7.9)	64 (31.7)	131 (64.9)	7 (3.5)
PMS symptoms						
Stress[a]	145 (63.6)	69 (30.3)	14 (6.1)	113 (55.9)	77 (38.1)	12 (5.9)
Palpitation[a]	62 (27.2)	113 (49.6)	53 (23.2)	56 (27.7)	120 (59.4)	26 (12.9)
Insomnia[a]	88 (38.6)	93 (40.8)	47 (20.6)	61 (30.2)	108 (53.5)	33 (16.3)
Fatigue[a]	184 (80.7)	33 (14.5)	11 (4.8)	112 (55.4)	82 (40.6)	8 (4.0)
Anxious[a]	117 (51.3)	79 (34.6)	32 (14.0)	103 (51.0)	84 (41.6)	15 (7.4)
Forgetful[b]	36 (15.8)	102 (44.7)	90 (39.5)	20 (9.9)	129 (63.9)	53 (26.2)
Headache[a]	135 (59.2)	62 (27.2)	31 (13.6)	89 (44.1)	92 (45.5)	21 (10.4)
Hot burning cheeks[b]	73 (32.0)	115 (50.4)	40 (17.5)	33 (16.3)	137 (67.8)	32 (15.8)
Tension gives rise to PMS[a]	122 (53.5)	88 (38.6)	18 (7.9)	85 (42.1)	102 (50.5)	15 (7.4)
Normal menstrual blood characteristics						
Lower abdominal pain[a]	170 (74.6)	45 (19.7)	13 (5.7)	100 (49.5)	82 (40.6)	20 (9.9)
Felt during 1st day of menstruation[a]	190 (83.3)	25 (11.0)	13 (5.7)	108 (53.5)	75 (37.1)	19 (9.4)
Knowledge on causes of menstrual disorder						
Causes of dysmenorrhoea						
Fibroid[a]	27 (11.8)	138 (60.5)	63 (27.6)	30 (14.9)	130 (64.4)	42 (20.8)
Uterine cancer[b]	62 (27.2)	144 (63.2)	22 (9.6)	61 (30.2)	121 (59.9)	20 (9.9)
Cervical cancer[b]	59 (25.9)	148 (64.9)	21 (9.2)	52 (25.7)	129 (63.9)	21 (10.4)
Endometriosis[a]	37 (16.2)	163 (71.5)	28 (12.3)	25 (12.4)	154 (76.2)	23 (11.4)
Sexual transmitted infection[b]	65 (28.5)	142 (62.3)	21 (9.2)	47 (23.3)	131 (64.9)	24 (11.9)
Causes of dysmenorrhoea						
Hormonal imbalance[a]	150 (65.8)	70 (30.7)	8 (3.5)	92 (45.5)	103 (51.0)	7 (3.5)
Fibroid[a]	56 (24.6)	136 (59.6)	36 (15.8)	32 (15.8)	137 (67.8)	33 (16.3)
Endometriosis[a]	31 (13.6)	176 (77.2)	21 (9.2)	22 (10.9)	169 (83.7)	11 (5.4)
Sexual transmitted infection[b]	40 (17.5)	162 (71.1)	26 (11.4)	31 (15.3)	138 (68.3)	33 (16.3)
Cervical cancer[a]	39 (17.1)	157 (68.9)	32 (14.0)	29 (14.4)	144 (71.3)	29 (14.4)
Uterine cancer[a]	41 (18.0)	155 (68.0)	32 (14.0)	29 (14.4)	146 (72.3)	27 (13.4)
Causes of amenorrhoea						
Hormonal imbalance	159 (69.7)	61 (26.8)	8 (3.5)	102 (50.5)	91 (45.0)	9 (4.5)
Brain cancer[a]	20 (8.8)	127 (55.7)	81 (35.5)	17 (8.4)	123 (60.9)	62 (30.7)
Obesity[a]	68 (29.8)	121 (53.1)	39 (17.1)	31 (15.3)	125 (61.9)	46 (22.8)
Imperforated hymen[a]	65 (28.5)	141 (61.8)	22 (9.6)	42 (20.8)	134 (66.3)	26 (12.9)
Chromosome abnormality[a]	58 (25.4)	150 (65.8)	20 (8.8)	40 (19.8)	142 (70.3)	20 (9.9)
Causes of oligomenorrhoea						
Hypothyroidism[a]	62 (27.2)	146 (64.0)	20 (8.8)	67 (33.2)	125 (61.9)	10 (5.0)
PCOS (polycystic ovarian syndrome)[a]	57 (25.0)	161 (70.6)	10 (4.4)	36 (17.8)	151 (74.8)	15 (7.4)
Birth control pills[a]	86 (37.7)	123 (53.9)	19 (8.3)	46 (22.8)	132 (65.3)	24 (11.9)

Table 4. The respondents' score on knowledge items on menstrual disorder among premarital men and women in Kota Bharu, Kelantan (Continued)

Items	Women (*n* = %)			Men (*n* = %)		
	Correct answer	Not sure	Incorrect answer	Correct answer	Not sure	Incorrect answer
Islamic knowledge on menstrual disorder						
Minimum length of menses is 1 full day[a]	63 (27.6)	71 (31.1)	94 (41.2)	32 (15.8)	84 (41.6)	86 (42.6)
Maximum length of menses is 10 days[b]	68 (29.8)	46 (20.2)	114 (50.0)	26 (12.9)	82 (40.6)	94 (46.5)
Minimum duration recovering (clean) from menses is 15 days 15 nights[a]	95 (41.7)	95 (41.7)	38 (16.7)	49 (24.3)	25 (61.9)	28 (13.9)
The person who exceeds the maximum length of menses is considered having 'Istihadah'[a]	140 (61.4)	80 (35.1)	8 (3.5)	59 (29.2)	131 (64.9)	12 (5.9)
Those in Istihadah does not need to take compulsory bath[a]	73 (32.0)	75 (32.9)	80 (35.1)	43 (21.3)	89 (44.1)	70 (34.7)
Those in Istihadah should perform prayer[a]	142 (62.3)	57 (25.0)	29 (12.7)	59 (29.2)	79 (39.1)	64 (31.7)
Those in Istihadah should perform prayer at a later time[b]	60 (26.3)	100 (43.9)	68 (29.8)	37 (18.3)	90 (44.6)	75 (37.1)
Those in Istihadah should not pray in the mosque[b]	61 (26.8)	110 (48.2)	57 (25.0)	43 (21.3)	88 (43.6)	71 (35.1)
Ramadhan fasting is compulsory to those in Istihadah[a]	109 (47.8)	83 (36.4)	36 (15.8)	48 (23.8)	83 (41.1)	71 (35.1)
Those in Istihadah only need to pay 'fidyah' in Ramadhan[b]	63 (27.6)	142 (62.3)	23 (10.1)	47 (23.3)	115 (56.9)	40 (19.8)
Sexual intercourse with husband is prohibited during Istihadah[b]	27 (11.8)	126 (55.3)	75 (32.9)	34 (16.8)	83 (41.1)	85 (42.1)
Those in Istihadah is prohibited from reading Al-Quran[b]	46 (20.2)	131 (57.5)	51 (22.4)	33 (16.3)	102 (50.5)	67 (33.2)

[a] *Positive-worded item*

[b] *Negative-worded item*

Attitude towards menstrual disorder

The proportion of good attitude among women was 64.8% while in men it was 35.2%. There was a significant difference in attitude scores on menstrual disorder between premarital men and women (Table 5). Table 6 shows in detail the percentage of respondents' score on attitude items on menstrual disorder among premarital women and men in Kelantan.

Discussion

This study was carried out where the majority of the population is Malay Muslim. In Islamic teachings, the husband or father has an equal role in handling family member's issues including female specific issues. Therefore, if they have knowledge on menstrual disorder, especially on the Islamic part, they can guide their wives and daughters if these problems

Table 5. The proportion of Attitude towards menstrual disorder in premarital men and women

Variable	Attitude *n* (%)		X^2 (df)	*P*-value
	Good	Poor		
Men (*n* = 202)	38 (35.2)	164 (50.9)	8.051 (1)	0.005*
Women (*n* = 228)	70 (64.8)	158 (49.1)		

**Chi Square test, p value <0.05 set as significant at 95% CI*

Table 6. The respondents' score on attitude items on menstrual disorder among premarital men and women in Kota Baharu, Kelantan

Items	Women (*n* = %)			Men (*n* = %)		
	Agree	Neutral	Disagree	Agree	Neutral	Disagree
Attitude towards menstrual disorder						
Male should know about menstrual disorders[a]	211 (92.5)	11 (4.8)	6 (2.6)	180 (89.1)	15 (7.4)	7 (3.5)
Traditional medicine is suitable to be used to treat menstrual disorders[b]	32 (14.0)	77 (33.8)	119 (52.2)	47 (23.3)	79 (39.1)	76 (37.6)
Islamic ruling regarding menstrual disorders should be taught during premarital course[a]	186 (81.6)	38 (16.7)	4 (1.8)	172 (85.1)	20 (9.9)	10 (5.0)
I will put effort to find more information on menstrual disorders in the mass media[a]	194 (85.1)	21 (9.2)	13 (5.7)	126 (62.4)	59 (29.2)	17 (8.4)
I am reluctant to ask regarding menstrual disorders from the healthcare providers[b]	130 (57.0)	47 (20.6)	51 (22.4)	81 (40.1)	58 (28.7)	63 (31.2)
I am not comfortable to discuss menstrual disorders with my partners[b]	135 (59.2)	48 (21.1)	45 (19.7)	114 (56.4)	44 (21.8)	44 (21.8)
I feel menorrhagia is normal[b]	114 (50.0)	57 (25.0)	57 (25.0)	78 (38.6)	64 (31.7)	60 (29.7)
I feel an irregular menstruation is normal[b]	146 (64.0)	43 (18.9)	39 (17.1)	101 (50.0)	53 (26.2)	48 (23.8)
I feel prolonged menstruation is a small problem[b]	195 (85.5)	16 (7.0)	17 (7.5)	146 (72.3)	36 (17.8)	20 (9.9)
I am embarrassed to discuss menstrual disorders with religious teacher[b]	164 (71.9)	31 (13.6)	33 (14.5)	116 (57.4)	38 (18.8)	48 (23.8)

[a]*Positive-worded item*

[b]*Negative-worded item*

occur. In Malaysia, there is a standard syllabus in school, which covers normal reproductive health and menstrual cycle; however, the syllabus does not extend to abnormal menstrual cycle.

The mean age of the respondents in our study was 24.0 years. The youngest respondent was 18 years old and the eldest was 40 years old. Previous studies were done among adolescents having a mean age of 15.6 and 15.4 years.[1-3] The study that had a most similar mean age (20.7 years) was among university students in Turkey.[15] In our study, the majority of our respondents had finished their secondary school level. This study took into consideration the variety of stream of education among the respondents, which were science, art and Islamic. This educational status variability may affect the knowledge and attitude percentage score of the respondents.

For the female respondents, half of them were not working, as many of them were still studying at tertiary education level whereas, the majority of male respondents were employed. Most female respondents received their first information on menstruation from their mothers and older sisters. Similarly, in the other study, mothers were the first information source regarding menstruation. On the other hand, the majority of male respondents in this study first learnt about menstruation from their friends and studied it at school. This reflects the social behaviour of our population where menstrual-related information is mainly shared among women.

Knowledge on menstrual disorder

This study showed a significantly higher knowledge score on menstrual disorder among women than men. As previously mentioned, information on menstruation is generally shared

among women; however, if men have this knowledge they can give support, advices and comfort. Sometimes, they can act as a referred person to the female members who suffer from such problems.

Female respondents scored higher in general knowledge and symptoms. This was most likely due to the fact that the questions covered experiences during menstruation. However, there was no significant difference in knowledge score of causes and Islamic ruling between the two groups, whereby the scores for both groups were low. This suggested that even women do not have adequate knowledge on causes of menstrual disorder and how to handle the issues according to Islamic teachings. Thus, these findings highlight the importance of further education on menstrual disorder not only to men but also to women who will experience it. Education to men also increases their perception of the possible severity of menstrual disorders and helps them to understand their partner or their female family members better. This also improves the dynamics of a healthy marriage.

In Islamic teachings, menstrual disorders may affect Muslim obligations, such as prayers, Ramadhan fasting and sexual relationship between husband and wife. For example, a woman who has menstruation is not obligated to pray and could not perform Ramadhan fasting or having intercourse with her husband and they may be facing pathological health problem. Therefore, it is important for both women and men to be able to differentiate between the two. This will help them to engage in proper Islamic exercises and prevent further health problems. Both female and male respondents were able to identify pathological menstruation ("Istihadah") but were not able to answer correctly on the Islamic ruling related to the condition. The findings suggested that education should not only focus on the types of menstrual disorder but also on medical and the relevant religious teachings on the issue. Knowledge on how to handle such issues based on religious teachings may reduce stress and anxiety of the affected woman and her spouse.

Attitude towards menstrual disorder

Male respondents were found to have less positive attitude towards learning more on menstrual disorders even though both men and women agreed that men should know about menstrual disorder. In Malaysia, especially in the Malay culture, menstrual disorders are still considered as a delicate issue related only to women, thus it is not discussed openly with the opposite sex. Consequently, women tend to hide their problems and are reluctant to seek help, especially from their spouse or male family members when their female family members are unavailable.

According to Wong LP et al, many girls and young women feel shameful and reluctant to seek help on problems with PMS and dysmenorrhoea.[17] This is partly due to the general conception that this is a normal phenomenon, which requires no medical advice.[17] Thus, the education on menstrual disorders should be included in premarital courses in preparing both partners for future family life.[18] This inclusion was also supported by positive attitude response from both men and women where more than 80% of respondents in both groups supported the suggestion.

Cultural beliefs, as well as religion play an important role in attitude or decision-making of certain people, especially those who are still young and not yet married.[12] Based on menstrual attitude questionnaire survey by McPherson, a good menstruation preparation with positive menarche experience would be related to more positive adult menstrual attitudes, experiences, and behaviours. Conversely, negative early menstrual experiences would correlate with subsequent negative experiences with menstruation.[12]

This study did not cover the practice component as it was done in a community setting and not among patients who suffer from menstrual disorders. Thus, this study was unable to discuss the health seeking behaviour of women experiencing menstrual disorder. It is beneficial to further explore the practice among the patients, as well as the current available education impact on health seeking behaviour among women and attitude of both men and women on this disorder.

Conclusion

This study highlights the need for proper educational module in educating both men and women on menstrual disorder to create a healthy symbiosis between the two genders in a family setting or society in general, as well as improving health-seeing behaviour in combating the psychosocial impact of menstrual disorder.

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ORIGINAL ARTICLE

Diabetic ketoacidosis at diagnosis of type 1 diabetes mellitus in Malaysian children and adolescents

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Abstract

Background: Diabetic ketoacidosis (DKA) is a late presentation of newly diagnosed type 1 diabetes mellitus (DM) in children. The aim of this study was to determine the clinical characteristics of type 1 DM at presentation so that appropriate actions can be taken to promote early diagnosis.

Methods: This was a retrospective cohort review from a patient registry database. Data on all patients younger than 20 years old diagnosed with type 1 DM who had been registered with the Malaysian Diabetes in Children and Adolescents Registry (DiCARE) from its inception in 2006 until 2009 were analysed.

Results: The study included 490 children and adolescents, out of which 57.1% were female. The mean (SD) age at diagnosis was 7.5 (3.7) years, which increased from year 2000 to 2009 [6.6 (3.3) years to 9.6 (3.5) years; p = 0.001]. An increasing percentage of DKA at diagnosis was observed from year 2000 (54.5%) to year 2009 (66.7%), which remained high and leveled between 54.5% and 75.0%. DKA was more common in patients with normal weight (p = 0.002) with no significant association with age, gender, ethnicity and status of family history of diabetes mellitus.

Conclusion: An increasing trend of age at diagnosis of patients with type 1 DM was observed. Besides that, proportion of DKA at diagnosis had remained high over the past decade. This study found that normal weight was associated with status of DKA, thus more detailed investigations are required to determine the risk factors for DKA.

Introduction

Type 1 diabetes mellitus (DM) accounts for more than 90% of childhood and adolescent diabetes.[1] Of the estimated 479,600 type 1 diabetic children worldwide, 24% were from the South-East Asian region and 6.4% from the Western Pacific region.[2–3] The annual incidence for childhood type 1 DM (0–14 year age group) ranged from 0.1 per 100,000 in China to 57.[6] per 100,000 in Finland.[3–5] The incidence of type 1 DM appeared to be low in the Western Pacific region with the exception of Australia and New Zealand.[4] In Malaysia, type 1 DM was estimated to account for 69.2% of children and adolescents with diabetes.[6]

Diabetic ketoacidosis (DKA) is a common presentation in children with new-onset type 1 DM, characterised by hyperglycaemia, ketosis and acidosis.[7] In addition, DKA is associated with cerebral oedema, which is the most common cause of diabetes-related death in children.[7] The prevalence of DKA at disease presentation can be reduced if diabetes is recognised early. A British study reported that delay in diagnosis had a significantly increased risk of DKA at disease onset.[8] It was also reported that 38.8% of children with type 1 DM had seen at least one doctor prior to the presentation with DKA.[9] This may suggest that early symptoms of type 1 DM might have been missed or misdiagnosed until the onset of DKA. Hence, adequate awareness and high index of suspicion among primary healthcare providers are crucial to prevent the occurrence of DKA and its associated morbidity and mortality. Besides that, DKA incurs extra medical expenditure. In the United States, the annual cost of treating DKA was estimated to be more than $1 billion when 25% of new-onset type 1 DM presented with DKA.[9]

This study aimed to determine the trend, the clinical presentation of type 1 DM and

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the pattern of DKA at diagnosis among Malaysian children and adolescents. We also aimed to determine the association between demographic profile of patients and status of DKA at disease presentation.

Methods

This was a retrospective cohort review from a patient registry database. Dataset of all patients with type 1 DM who had been reported to the Malaysian Diabetes in Children and Adolescents Registry (DiCARE) from August 2006 to December 2009 were retrieved and analysed. DiCARE was initiated in August 2006 as an ongoing online registry for <20-years-old diabetic patients from hospitals in Malaysia. Site participation and reporting of patients to DiCARE were entirely voluntary.[6]

The registered dataset comprises patients' demography, weight status (underweight, normal weight and overweight), symptomatic (DKA versus non-DKA) or asymptomatic, and treatment options at disease onset. Year-end census was collected annually to monitor treatment changes, diabetes re-classification and complications. The diagnosis of type 1 DM was made by the treating physician based on the clinical characteristics and insulin dependence (i.e. insulin requiring for survival), in keeping with the 1999 revised WHO diagnostic criteria for diabetes mellitus.[10] The measurement of insulin autoantibodies of all patients was not performed due to the limited resources in the local setting. Patients were excluded from this study if they were not dependent on insulin or their diagnosis had been reclassified by the attending physicians to other types of diabetes in the year-end census.

Ethics approval was obtained from the Malaysian Research Ethical Committee (MREC), Ministry of Health (MOH) and the respective university hospitals. In the data definition, underweight was defined as body–mass index (BMI) below the 5th percentile while overweight was more than 85th percentile based on the Centers for Disease Control and Prevention (CDC) BMI chart that was provided online.[11] In the data registry, DKA was defined as the presence of hyperglycaemia with blood glucose level of >200 mg/dL (11 mmol/L), metabolic acidosis with venous pH <7.3 and/or plasma bicarbonate level of <15 mmol/L associated with ketonaemia and/or ketonuria.[7]

Statistical Analysis

Mean with standard deviation was presented for the numerical variables as there was no serious violation of assumption for normality. Frequency with percentage was presented for categorical variables. Pearson Chi square and Fisher's exact test were used to determine the association between the different age groups with the profile or clinical variables, the association between the profiles or clinical variables with status of DKA, and the association of year at diagnosis with status of DKA. Analysis of variance (One-way ANOVA) was used to determine the mean difference of age at diagnosis by year of diagnosis. All analyses were carried out using the IBM SPSS version 20.0 (IBM Corp. Released 2011. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.).

Results

A total of 490 children and adolescents with type 1 DM were notified by 34 centres from different states of Malaysia over a 40-month period. The mean (SD) age at diagnosis was 7.5 (3.7) years, ranging from 2 months to 16 years. The proportion between genders was almost equal. At diagnosis, majority were 5 to <15 year-old (69.9%). Positive family history of diabetes (either type 1 or type 2) was present in 45.5% of patients. Approximately one-third (34.8%) of the patients were underweight while 10.1% were either overweight or obese (Table 1).

Majority, 98.0% (438/447) of the patients were symptomatic. There were 64.7% (289/447) patients who presented with DKA at diagnosis. Of the symptomatic patients without DKA, 98.0% (146/149) had polyuria/polydipsia and 70.5% (105/149) had weight loss (Table 1). A significant increase in the mean (SD) age at diagnosis over the years from 6.6 (3.3) years in 2000 to 9.6 (3.5) years in 2009 (p = 0.001) was observed (Table 2).

Table 1. Demographic and clinical profile of children and adolescents with type 1 DM (*N* = 490)

Demographic and clinical profile	*n*	(%)	Mean (SD)
Age at diagnosis (years)			7.5 (3.7)
Age group at diagnosis (n = 482)			
Less than 5 years	114	(23.7)	
5 and less than 10 years	185	(38.4)	
10 and less than 15 years	152	(31.5)	
More than 15 years	31	(6.4)	
Gender			
Male	210	(42.9)	
Female	280	(57.1)	
Ethnicity (n = 488)			
Malay	192	(39.3)	
Chinese	170	(34.8)	
Indian	103	(21.1)	
Others	23	(4.7)	
BMI status (n = 396)			
Underweight	138	(34.8)	
Normal	218	(55.1)	
Overweight	40	(10.1)	
Family history with diabetes mellitus (n = 424)			
Yes	193	(45.5)	
No	231	(54.5)	
Clinical features at diagnosis (n = 447)			
DKA	289	(64.7)	
Symptomatic without DKA	149	(33.3)	
Asymptomatic	9	(2.0)	

Table 2. Mean age at diagnosis and frequency of DKA in children and adolescents with type 1 DM from 2000 to 2009

Year of diagnosis	Age at diagnosis			
	n	Mean	SD	95%CI
2000	23	6.6	3.3	5.2 - 8.0
2001	32	6.2	3.4	5.0 - 7.4
2002	21	6.5	4.0	4.7 - 8.3
2003	44	6.9	3.3	5.9 - 7.9
2004	43	8.3	3.4	7.2 - 9.4
2005	44	8.2	4.1	7.0 - 9.4
2006	44	8.1	3.6	7.1 - 9.2
2007	49	9.2	3.1	8.3 - 10.1
2008	55	8.4	3.5	7.5 - 9.3
2009	46	9.6	3.5	8.5 - 10.6

Association between year of diagnosis and mean (SD) of age at diagnosis was significant at P-value <0.001, by one-way ANOVA

Positive family history (p = 0.003) of either type 1 or type 2 DM and overweight at diagnosis (p = 0.036) were associated with age group at diagnosis where both were common in the older age-group. Though DKA at diagnosis seemed to be more common in the younger age group; however, it was not statistically significant (Table 3).

Table 3. Clinical characteristics of children and adolescents with type 1 DM by age group at diagnosis

Profile/Clinical	<5 years		5 and < 10 years		10 and < 15 years		≥ 15		*P* value
	n	%	*n*	%	*n*	%	*n*	%	
BMI status									
Underweight	31	32.6	55	36.4	45	37.5	3	12.5	0.036
Normal	57	60.0	85	56.3	56	46.7	18	75.0	
Overweight	7	7.4	11	7.3	19	15.8	3	12.5	
Family history with DM									
Yes	38	37.6	67	42.1	63	48.8	21	75.0	0.003
No	63	62.4	92	57.9	66	51.2	7	25.0	
Status of DKA									
DKA	78	70.9	101	58.7	89	65.4	16	66.7	0.207
Non-DKA	32	29.1	71	41.3	47	34.6	8	33.3	
Symptoms of non-DKA									
Classical	30	96.8	60	89.6	42	89.4	8	100.0	0.483
Non-classical	1	3.2	7	10.4	5	10.6	0	0.0	

Result was analysed using Pearson chi-square

No significant difference was observed between patients presented with and without DKA, and age at diagnosis, gender, ethnicity and status of family history of diabetes mellitus. DKA was more common in children with lower BMI (p = 0.002; Table 4). No multivariate analysis was conducted as only BMI was found to be significantly associated with DKA at diagnosis. An increasing percentage of DKA at diagnosis was observed from year 2000 (54.5%) to year 2009 (66.7%), which remained high and leveled between 54.5%–75.0%. The association between year of diagnosis and status of DKA was not statistically significant (P = 0.927; Table 5).

Table 4. Demographic and clinical profile of children and adolescents with and without DKA at diagnosis

Profile/Clinical	DKA		Non-DKA[b]		*P* value
	n	(%)	*n*	(%)	
Age at diagnosis (year)[a]	7.2	(3.7)	7.6	(3.7)	0.250
Age group at diagnosis (n = 482)					
<5 years	78	(70.9)	32	(29.1)	0.207
5 and <10 years	101	(58.7)	71	(41.3)	
10 and <15 years	89	(65.4)	47	(34.6)	
<15 years	16	(66.7)	8	(33.3)	
Gender (n = 490)					
Male	130	(66.0)	67	(34.0)	0.525
Female	159	(63.1)	93	(36.9)	

Table 4. Demographic and clinical profile of children and adolescents with and without DKA at diagnosis (Continued)

Profile/Clinical	DKA		Non-DKA[b]		*P* value
	n	(%)	*n*	(%)	
Ethnicity (n = 488)					
Malay	110	(65.1)	59	(34.9)	0.392
Chinese	106	(65.8)	55	(34.2)	
Indian	56	(58.9)	39	(41.1)	
Others	17	(77.3)	5	(22.7)	
BMI status (n = 396)					
Underweight	71	(55.9)	56	(44.1)	0.002
Normal	140	(68.3)	65	(31.7)	
Overweight	14	(40.0)	21	(60.0)	
Family history with DM (n = 424)					
Yes	99	(56.9)	75	(43.1)	0.065
No	142	(65.1)	76	(34.9)	

[a] *Reported in mean (SD)*

[b] *Non-DKA is based on symptomatic without DKA and asymptomatic group Result was analysed using Pearson chi-square*

Table 5. Proportion of Non-DKA/DKA based on year of diagnosis, 2000–2009

Year of diagnosis	Non-DKA (%)	DKA (%)
2000	45.5	54.5
2001	41.9	58.1
2002	40.0	60.0
2003	34.1	65.9
2004	35.1	64.9
2005	25.0	75.0
2006	33.3	66.7
2007	37.5	62.5
2008	36.8	63.2
2009	33.3	66.7

The association between year of diagnosis and status of DKA was not significant (P = 0.927) Result was analysed using Pearson chi-square

Discussion

The proportion of DKA at presentation of type 1 DM among children and adolescents in Malaysia is high (64.7%) as compared to other countries (19.4% in Finland,[12] 25% in Kuwait[13] and Ireland,[14] 37.2% in Austria,[15] and 26.3% in Germany).[16] However, it is similar to the incidence reported in our neighbouring country Thailand (77.0%) more than 10 years ago.[17]

The proportion of DKA at diagnosis of type 1 DM has been persistently high in Malaysia despite advancement in infrastructure and medical supply. This may be due to a persistent lack of awareness about diabetes mellitus in children among the general public, as well as the primary healthcare providers. It had been reported that DKA prevention programme in the province of Parma, Italy, which was primarily aimed at improving the knowledge of diabetes mellitus in children, had resulted in a significant decrease in prevalence of DKA at type 1 DM onset from 78% to 12.5%.[18] Hence, in order to decrease the proportion of DKA at disease presentation in Malaysia, public awareness and education on type 1 DM should be emphasised. This can be done

by campaigning to disseminate information, especially in schools and in primary healthcare centres, highlighting the early symptoms of diabetes mellitus, such as nocturnal enuresis in a previously dry child, polyuria and polydipsia. Messages disseminated to a large population through school, parents associations and primary healthcare centres should be simple and easy to understand. Easy access to healthcare providers who are trained and experienced in diabetes mellitus should be made available. Many patients with type 1 DM could have been diagnosed early and DKA prevented if they were better informed and had presented themselves early to the primary healthcare providers who were trained to recognise classic hyperosmolar symptoms of type 1 DM.

It had been reported that risk factors associated with DKA at diagnosis were young age i.e.<5 years, diagnostic error, ethnic minority, lower BMI, history of preceding infection and delayed treatment.9 Many studies reported a higher risk of DKA at disease onset in children younger than 2 years.[12–14] In our study, though DKA at diagnosis appeared to be more common in children aged >5 years, it was not statistically significant. Also, there was no gender preponderance. Another study reported that most of the children were underweight at diagnosis of type 1 DM,[13] and children with lower BMI had a higher risk of DKA.[12] Our study showed a similar finding where higher proportion of DKA was seen in the normal weight and underweight children with type 1 DM.

We also observed that overweight at diagnosis was significantly more common in the older age group (>10 years old). The observation of overweight in these patients with type 1 DM may be partly explained by the increasing prevalence of obesity worldwide and also the higher susceptibility of peripubertal adolescents to overweight/obesity caused by environmental factors. Although, this observation may cast doubt on the classification of diabetes in these overweight or obese children, the diagnosis of type 1 DM was supported by the year-end census, which reported persistent insulin dependence and no re-classification of diabetes by the treating clinicians. Furthermore, the clinical characteristics of our patients were quite similar to other studies. The mean (SD) age at diagnosis in this study was 7.5 (3.7) years, which is quite similar to other reports (mean of 7.6 to 8.9 years).[8,9]

Although, C-peptide, insulin and pancreatic autoantibodies measurements are useful to classify diabetes, laboratory facilities were not always available in most of the reporting centres. These facilities should be made easily available in all hospitals caring for diabetic patients to accurately diagnose and classify the disease. Correct classification of diabetes enables healthcare providers to treat patients appropriately according to their disease pathophysiology. Patients with type 1 DM require insulin replacement therapy while patients with type 2 DM need treatment to improve insulin resistance and preserve the declining beta-cell function. Accurate epidemiological data are also important to guide planning of healthcare systems and policies to further improve diabetes care in the country.

Protective factors associated with reduced risk of DKA at diagnosis reported in other studies include positive family history of first degree relative with type 1 DM, higher parental education level and higher background incidence of type 1 DM in the community.[9] Although nearly half (45.5%) of Malaysian children and adolescents with type 1 DM had positive family history of diabetes mellitus (type 1 and/or type 2) in their first-degree relatives, we still experience a high proportion of DKA at presentation. The protective effect of positive family history was not shown in our study as many of the patients might had positive family history of type 2 DM with slower onset of disease.

From the 2010 Population and Housing Census of Malaysia, the Malaysian population of 28.3 million consist of Malay 67.4%, Chinese 24.6%, Indian 7.3% and others 0.7%.19 Malay, Chinese and Indian made up 39.3%, 34.8% and 21.1% of the type 1 DM patients, respectively. Our study found a higher proportion of Malaysian Chinese and Indian with type 1 DM, compared to Malay. Variable gene polymorphism in the major histocompatibility complex (MHC) or other genetic susceptibility regions in this ethnic group may have predisposed the individuals to the development of type 1 DM when triggered by various environmental agents.[20]

Up to 2.0% (9/447) of patients in this study was reported to be asymptomatic at diagnosis. These patients were likely to be those with positive family history of diabetes who had greater awareness of the disease, resulting in

early diagnosis before manifestation of overt classical symptoms, or those with the disease detected incidentally during an outpatient clinic visit for other medical conditions.

From year 2000 to 2009, there was a significant increase in the mean (SD) age at diagnosis in Malaysian children with type 1 DM. In other studies, age at diagnosis had also been reported to increase with time, which may indicate a change in non-genetic risk factors affecting specifically young children.[21,22] Although, most of the autoimmune diseases are more common in females, most of the studies including ours did not show any gender preponderance.

These results are useful to increase awareness among healthcare providers, especially to the general practice with regards to the magnitude of the disease. Besides that, it is also aimed to create awareness among parents, especially to prevent late diagnosis of children with type 1 DM. Last but not least is to share the information, which will be useful for the researchers who are interested to do research on children with DM.

Limitations

This is a register based cohort study. The data was provided by the clinicians managing the patients. At the time of our study, not all hospitals in Malaysia were able to participate in DiCARE. The results of our study need to be interpreted with caution in view of the missing data that is inevitable with registry based data. However, the sample is nearly to 500 and considered as large especially for data children with type 1 diabetes mellitus. Previous study has found that a sample size of approaching 500 or more are to be of adequate in estimating the parameter in the intended population.[23]

Another limitation of our study is that the clinical data on access to primary care prior to the indexed hospital visit where patients were diagnosed and notified were not captured. Improvement in case report forms, training of personnel in filling the forms, extension to nationwide coverage of DiCARE, involvement of the relevant government agencies are currently in progress. We hope that the improved cumulative data in the near future would give us a clearer picture of the clinical presentation of type 1 DM in Malaysia.

This study underscores the persistently high percentage of DKA in Malaysian children and adolescents at diagnosis of type 1 DM over the past decade. DKA was more common in patients with normal weight or underweight. There was also an increase in age at diagnosis over the last 10 years. The gap that was identified includes the lack of early detection at primary care level, since almost all of the patients with type 1 DM were symptomatic at presentation. Effective training of primary care providers on symptoms and signs and prompt treatment could have prevented many patients from developing DKA. Besides that, awareness must be created amongst the younger population, parents and teachers.

Biochemical testing for classification of diabetes should be made easily available in developing countries to provide accurate diagnosis and hence appropriate patient management. Though the present data from DiCARE may not accurately represent all Malaysian children, further improvement in patient coverage, training of personnel in data collection, upgrading the reporting system and involvement of the government agencies will definitely help in our initial steps to prevent DKA at diagnosis in these children and adolescents.

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Conflict of interest

The author(s) declared no conflict of interest during the conduct of the study, nor its findings.

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ORIGINAL ARTICLE

Effectiveness of pictorial health warning on cigarette packages: A cross-sectional study in Sarawak, Malaysia

Rahman MM, Arif MT, Abd Razak MF, Suhaili MR, Tambi Z, Akoi C, Gabriel Bain M, Hussain H

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Abstract

Introduction: Specific health warning placed on the tobacco product packages is considered as an effective and low-cost method for increasing the knowledge and awareness among the community. Thus, a study was conducted to assess the perception of pictorial health warnings (PHWs) against smoking among the adult rural population of Sarawak.

Methods: Cross-sectional data were collected from 10 villages in Kota Samarahan and Kuching Division by face to face interview using modified Global Adult Tobacco Survey questionnaire. Non-probability sampling method was adopted to select the villages. All the households of the selected villages were visited and an adult member was selected randomly from each house irrespective of the sex. After missing value imputation, 1000 data were analysed using statistical software IBM SPSS 20.0 version.

Results: Analysis showed that 28.8% of the respondents were current smokers, 7.8% were past smokers and the rest were non-smokers. Six items of pictorial health warnings were evaluated with five point Likert's scales for attractiveness, fearfulness and adequacy of the information. Analysis revealed that the majority of the respondents had perceived awareness on PHWs, but the smokers believed that this was not adequate to make them quit smoking. Only one-fifth (19.7%) of them reported that current pictorial health warnings were sufficient to motivate people to quit smoking.

Conclusion: Though the PHWs on cigarette packages are appealing, it is not sufficient as a reason to stop smoking. Thus, an approach using an integrated anti-tobacco public health programme should be focused into the specific targeted community.

Introduction

Tobacco smoking epidemic is one of the biggest public health threats all over the world. Nearly 6 million people die each year due to tobacco-related diseases. More than 5 million of those deaths are the result of direct tobacco use while more than 600,000 are the result of non-smokers being exposed to second-hand smoke. Approximately one person dies every 6 seconds due to tobacco accounting for one in 10 adult deaths.[1] Nearly 80% of the more than 1 billion smokers worldwide live in low- and middle-income countries, where the burden of tobacco-related illnesses and death is heaviest.[2] The burden of smoking is partly due to the aggressive marketing strategies of multinational tobacco companies.[3] The World Health Organization Framework Convention on Tobacco Control (WHO FCTC), the world first public health legal binding international treaty was ratified on 27 February 2005 to counter the problem of "globalisation of the tobacco epidemic." It is an evidence-based treaty that reaffirms the right of all people to the highest standard of health. The main objective of the framework is "to protect present and future generations from the devastating health, social, environmental and economic consequences of tobacco consumption and exposure to tobacco smoke." This framework was ratified by 168 countries and consisted of certain standards that signatory countries are encouraged to implement.[4] Malaysia is among the signatory countries of WHO FCTC and has been taking several measures against smoking. This included the enactment of the Control of Tobacco Product (Amendment) Regulation in 2008, whereby effective from 1 January 2009, every cigarette pack sold in Malaysia is required to be printed with Pictorial Health Warnings

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(PHWs). This initiative put Malaysia as the fourth country to implement the PHWs in the Association of Southeast Asian Nations (ASEAN) region, after Singapore, Thailand and Brunei.[5] The PHWs serve to create cost-effective means to increase public awareness about the dangers of tobacco use. Currently, there are 42 countries that represent approximately 42% of world population making PHWs mandatory on cigarette packages (WHO, 2013).[6] Since the implementation of the PHWs in 2009, there were limited studies done locally on the impact of the PHWs on the adult population, especially in the state of Sarawak. Evaluation of the impact of this would help the relevant authorities to improve and enhance this initiative to better serve its purpose to increase awareness on the danger of smoking and thus decreasing the prevalence of smoking in Malaysia. The objective of this study was to explore the perception on PHWs on cigarette packages among the people of Sarawak.

Methods

Study design and sampling procedure

This was a cross-sectional study conducted in 10 different Kampungs (villages), in two of the 11 divisions in Sarawak. Five Kampungs (villages) from Kota Samarahan and Kampungs (villages) from Kuching division were selected. A non-probability sampling technique was adopted to select the Kampungs. All of the households of the Kampungs were visited. One respondent aged 18 years or more was selected randomly irrespective of sex from each household. Respondents who did not consent or unwilling to participate; age below 18 years, persons incapable of answering the questionnaires and those visiting the state were excluded from the study. A total of 1000 data from 10 Kampungs were finally analysed. Detailed procedure has been described elsewhere.[7]

Instrument development and data collection procedure

A modified data collection instrument was developed based on Global Adult Tobacco Survey (GATS)[8] and other relevant additional instruments were also consulted. A pre-tested questionnaire was done in a non-sample area utilising the Malay language translated questionnaire. Data were collected using face to face interview by Doctor of Public Health (DrPH) first year students using an interviewer administered questionnaire. A semi-structured questionnaire was developed consisting of several parts, such as socio-demographic characteristics, tobacco use, behaviour and its patterns and also its related issues of PHWs. Respondents were asked whether they have ever seen any health warning on cigarette packs (yes/no) and then asked what type of health warnings. Six sets of health warnings were evaluated (Figure 1) viz. "Smoking can cause lung cancer", "Smoking can cause premature birth", "Smoking can cause gangrene", "Smoking can cause neck cancer", "Smoking can cause mouth cancer" and "Smoking can cause miscarriage. The PHWs in the cigarette packets were evaluated in terms of attractiveness, fearfulness and adequacy of information. Based on "Control of Tobacco Product (Amendment) Regulations, Malaysia, 2008, the six items of PHWs were evaluated with five point Likert's scales. Pre-testing of the questionnaire was done in a non-sample area. A minor change of questionnaire was made after pre-testing. The study proposal was approved by the Technical Review Committee of the Faculty of Medicine and Health Science (FMHS) and Research and Innovation Management Centre (RIMC), Universiti Malaysia Sarawak (UNIMAS). Ethical clearance was also taken from the Ethics committee of the Faculty of Medicine and Health Sciences, UNIMAS.

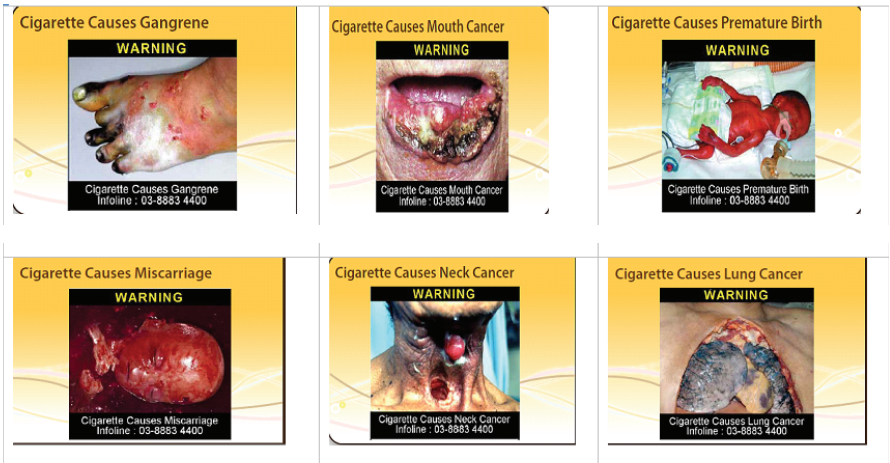

Figure 1. Pictorial health warning on the cigarette packages

Data processing and analysis

Data were entered manually and cross-checking was done using IBM SPSS Software 20.0 version.[9] After validation, descriptive statistics were presented to summarize participants' socio-demographic characteristics, pattern and frequency of smoking. Missing data were carefully examined and were imputed. However, important variable, such as smoking history, if not collected was not included in the final data analysis.

Results

Socio-demographic characteristics of the respondents

Details of socio-demographic characteristics of the respondents are presented in Table 1. More than half (52%) of the respondents were men and the rest were women. Approximately two-fifth (41.1%) of the respondents had higher secondary and above education followed by primary level of education (27%). The majority of the respondents were Malays (91.5%) and Muslims (92.2%). The mean family size was 5.37 with standard deviation 2.1. Three fourths (74.8%) respondents were married. One-third of the respondents were engaged in any gainful job, such as in service sectors (24%) and 10.2% of respondents were businessmen. However, 65.8% were engaged in different types of job, such as housewife, students, self-employed and others. To determine the socio-economic status, number of living room was used as proxy variables. The mean number of living room was 2.99 and one-third of the respondents had 1–2 living rooms (32.9%) and less than one-third had more than 4 living rooms (28.7%). Analysis showed that 28.8% of the respondents were current smokers, 7.8% were past smokers and the rest were non-smokers (Table not shown). The mean age of smokers was 40.09 years with standard deviations of 17.2 years.

Table 1. Socio-demographic characteristics of the respondents (n = 1000)

Characteristics	Frequency	%	95% CI	
			Lower bound	Upper bound
Age in years				
<20	124	12.4	10.4	14.4
20–29	206	20.6	18.1	23.1
30–39	206	20.6	18.1	23.1
40–49	187	18.7	16.4	21.1
50–59	123	12.3	10.3	14.4
≥60	154	15.4	13.1	17.7
Mean (SD)	4.01(17.2)		39.05	41.19
Genders				
Male	520	52.0	48.9	55.1
Female	480	48.0	44.9	51.1
Level of education				
No formal education	169	16.9	14.6	19.2
Primary	270	27.0	24.3	29.8
Secondary	150	15.0	12.9	17.2
Higher secondary and above	411	41.1	38.1	44.2
Religion				
Muslim	992	92.2	90.5	93.8
Non-Muslim	78	7.8	6.2	9.5
Ethnicity				
Malay	915	91.5	89.7	93.2
Chinese	85	8.5	6.8	10.3
Family Size				
<5	366	36.6	33.6	39.6
≥5	634	63.4	60.4	66.4
	5.37 (2.1)		5.23	5.51

Table 1. Socio-demographic characteristics of the respondents (n = 1000) (Continued)

Characteristics	Frequency	%	95% CI	
			Lower bound	Upper bound
Marital status				
Unmarried	252	25.2	22.5	27.9
Married	748	74.8	72.1	77.5
Nature of work				
Service	240	24.0	21.4	26.7
Business	102	10.2	8.4	12.1
Others	658	65.8	62.9	68.6
No. of rooms				
1–2	329	32.9	30.1	35.8
3	384	38.4	35.4	41.4
≥4	287	28.7	25.9	31.4
Mean (SD)	2.99 (1.1)		2.90	3.06

Pattern of health warnings on cigarette packages

One-fifth (19.4%) of respondents reportedly mentioned that they did not see any health warnings. Figure 2 shows the percentage distribution of the responses on PHWs. Highest percentages reported that smoking causes lung cancer (43.2%) followed by smoking causes prematurity (40.9%), smoking causes gangrene (37.9%) and smoking causes miscarriage (32.7%) and the rest were non-smokers (Table not shown). The mean age of smokers was 40.09 years with standard deviations of 17.2 years.

Respondent's reactions to pictorial health warning labels

Table 2 shows the adult reactions towards the PHWs. Analysis revealed that the majority of the respondents were optimistic about the attractiveness of the warning (varies from 84% to 89%). However, very few reported that the PHWs were not attractive. Similar results were also found in terms of fearfulness, which varies from 78% to 85%. Regarding the adequacy of the PHWs, 77% to 86% of the respondents had positive reactions towards knowledge of health effects of smoking.

Figure 2. Multiple responses to pattern of health warnings

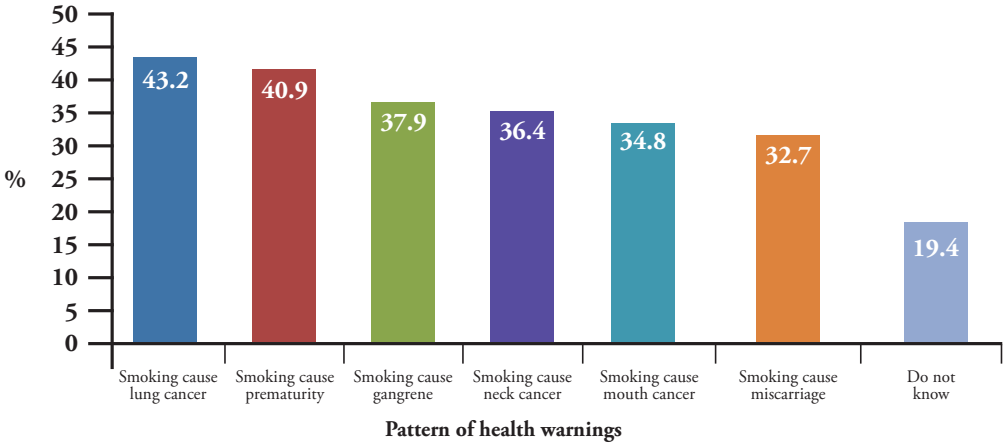

Table 2. Percentage distribution of respondents reactions towards PHWs (*n* = 1000)

Propositions	Smoking causes					
	Premature birth	Miscarriage	Mouth cancer	Gangrene	Neck cancer	Lung cancer
Attract attention						
Do not attract	5.1	5.8	4.4	5.0	4.4	4.4
Less attract	1.0	0.9	0.6	1.9	1.6	1.0
Moderately attract	7.6	7.9	5.1	8.9	7.4	5.7
Attractive	12.2	15.5	14.0	11.5	7.0	11.6
Very attractive	74.1	69.9	75.9	72.7	79.6	77.3
Mean score (SD)	4.46 (1.0)	4.43 (1.1)	4.56 (1.0)	4.45 (1.1)	4.56 (1.0)	4.56 (1.0)
Scariness						
Not scared at all	6.2	6.1	4.8	5.8	4.8	4.9
Less scared	5.4	4.4	3.0	5.8	2.0	3.0
Moderately scared	9.1	8.5	8.7	10.7	8.0	7.7
Scared	8.7	8.4	7.9	7.8	12.8	7.8
Very scared	70.6	72.6	75.6	69.9	72.4	76.6
Mean score (SD)	4.32 (1.2)	4.37 (1.2)	4.47 (1.1)	4.30 (1.2)	4.46 (1.1)	4.48 (1.1)
Sufficient in information						
Not informative at all	8.1	7.4	6.5	6.7	6.8	7.5
Less informative	3.7	3.5	4.3	4.4	3.2	2.2
Moderately informative	10.9	7.7	8.7	6.9	4.0	9.0
Informative	10.2	13.4	10.0	13.1	13.4	11.7
Very informative	67.1	68.0	70.5	68.9	72.6	69.6
Mean score (SD)	4.25 (1.3)	4.31 (1.2)	4.34 (1.2)	4.33 (1.2)	4.42 (1.2)	4.34 (1.2)

Table 3. Opinion on pictorial health warnings on cigarette packages

Opinion	Frequency	%	95% CI	
			Lower bound	Upper bound
Whether health warning enough to motivate people to stop smoking (n = 1000)				
Yes	197	19.7	17.3	22.1
No	638	63.8	60.9	66.8
Not Sure	165	16.5	14.2	18.7
Intention to quit smoking in the next 12 months (n = 288, smokers)				
Yes	90	31.3	25.7	36.5
No	196	68.1	62.8	73.5
Not Sure	2	0.7	0.0	1.7
Attempted to quit smoking in last 12 months (n = 288, smokers)				
Yes	100	34.7	29.2	39.9
No	188	65.3	60.1	70.8
Confident to remain a non-smoker after seeing health warnings (n = 625, never smokers)				
Yes	522	83.5	80.6	86.3
No	50	8.0	6.0	10.2
Not sure	53	8.5	6.4	10.8

Opinion on pictorial health warning labels

Both smokers (*n* = 288, 28.8%) and non-smokers (*n* = 712, 71.2%) were asked whether the "health warnings were enough to encourage people to stop smoking". One-fifth (19.7%) of the respondents were of the opinion that the current PHWs were not adequate to encourage people not to smoke, and another 16.5% were not sure about the PHWs. Smokers were asked whether they had any intention to quit in the next 12 months. Less than one-third (31.3%) of them reported that they had intention to quit smoking in the next 12 months and among them, 34.7% attempted to quit smoking. On the contrary, the never-smokers (*n* = 625) were asked whether they are confident to refrain themselves from starting smoking after seeing these health warnings. Four fifths (83.5%) were confident to remain non-smokers. However, 8% of them were not confident to remain as a non-smoker.

Discussion

The graphic health warnings on tobacco packages are an easy, inexpensive way to communicate the truth about tobacco consumption in the general population. The warnings increase awareness about the risks of tobacco use. PHWs are considered as potential methods in multilingual societies to communicate the risks of tobacco use to consumers. It should be eye catching, informative and economically feasible.[10,11] Extensive research in Canada suggests that large pictorial display (more than 50%) and strongly worded health warnings, supported by emotionally strong graphics, are highly effective in tobacco control.[12,13] Our study found that approximately one-fifth of the respondents did not ever see any PHWs on cigarette packs. More than four fifths of the respondents (both smokers and non-smokers) had identified that the PHWs were not enough to motivate smokers to quit smoking. However, approximately 31.3% of smokers described their intention to quit after seeing the PHWs, while 83.5% of non-smokers described their willingness to remain non-smoker after seeing the PHWs. These findings clearly depicted that the more prominent and direct health warning are, the more effective it would be to cause any change in perception and behaviour.[10] The PHWs on cigarette packages had an impact on both smokers and non-smokers, but the pictures need to be improved and refined to create better awareness regarding the dangers of smoking. Our study found a conflicting result about the PHWs as 84% to 89% of the respondents had a positive opinion about the attractiveness of the pictures. Very few respondents opined that the PHWs were not attractive. Similar results were also found in terms of scariness of the picture and sufficiency of information that had positive reactions towards knowledge of health effects of smoking. Our data showed that only one fourths of the respondents had intention to quit smoking in next 12 months. Viewing the pictorial warning had little impact on the desire to quit smoking. Kishore et al. (2013)[14] analysed the multi-country GATS data from Bangladesh, India and Thailand revealed that majority (more than two fifths) of the smokers were either unable to quit or unwilling to quit despite of awareness about smoking hazards. On the contrary, some previous studies concluded that warning labels made them not only think about the health risks of smoking but also made them think about quitting smoking.[15,16] This was also consistent with Ukraine Global Adult Tobacco Survey (WHO, 2010).[17] Another study in Malaysia found that warning labels have a relationship with quitting interest that is the warnings labels has stimulatory thoughts about quitting smoking.[18] This could be as a result of their nicotine dependence clouding their judgment. The Surgeon General Report (2012) concluded that there is a strong causal relationship between smoking and addiction to nicotine.[19] Another reason for not quitting could be that smoking is considered as part of their routine life as smokers had the common perception that it gave them an opportunity to relax, make friends, helps in work productivity, and others. Thus the "routine" perception of smoking was another reason for poor or no attempt to quit smoking.[20] Previous studies reported that though the large number of smokers desire to quit smoking, but only very few of them are successful.[21] Haddad and Petro-Nustas (2006)[22] opined that quitting smoking is a complex process and depends on physiological, psychological, environmental, and social factors. Nicotine content in tobacco is highly addictive.[23] Smoking tobacco causes rapid distribution of nicotine to the brain. With the long continued use, the nicotine receptor might be sensitised and withdrawal of nicotine leads observable physical abstinence syndrome.[24]

The key limitation of this study concerns the use of a convenience sample, which may not be representative of the Sarawak population. Only two divisions were purposively selected for data collection and most of the population were Malays. Hence, the perceptions of pictorial warnings among the diverse racial groups living in Sarawak were not evaluated. Another limitation of this study was that, only descriptive evaluation of the graphic health warnings was done depending on respondents' self-reported information, which might not be reflective of their educational background.

Our findings suggest that the Malaysian PHW labels are not very effective for certain target population. The warning labels do not effectively increase the desire to quit, especially among the smokers. However, it may deter non-smokers and early smokers from smoking. Although the temporal association between PHWs and quitting smoking was not established due to cross-sectional study design, the findings indicated that warning labels should be beneficial to the population if the graphic displays could be made more noticeable, readable, believable and memorable in line with the WHO FCTC. This may be a key element in reducing the attractiveness of smoking, especially among young adults and teenagers and it should be part of a larger public health education effort.

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Roles of primary care physicians in managing bipolar disorders in adults

Awaluddin A, Jali N, Bahari R, Jamil Z, Haron N on behalf of Development Group Clinical Practice Guidelines Management of Bipolar Disorder in Adults (2014).

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Abstract

Management of bipolar disorder (BD) is challenging due to its multiple and complex facets of presentations as well as various levels of interventions. There is also limitation of treatment accessibility especially at the primary care level. Local evidence-based clinical practice guidelines address the importance of integrated care of BD at various levels. Primary care physicians hold pertinent role in maintaining remission and preventing relapse by providing systematic monitoring of people with BD. Pharmacological treatment in particular mood stabilisers remain the most effective management with psychosocial interventions as adjunct. This paper highlights the role of primary care physicians in the management of BD.

Introduction

Management of BD is inherently challenging as the understanding of the disease is still limited even amongst the healthcare providers. The lifetime prevalence of BD I is 0.6% and BD II 0.4%, while mean age of onset is 18.2 years for BD I and 20.3 years for BD II (refer to Table 1). Women are slightly more affected than men. BD is highly heritable and the risk is inversely related to age, educational level and employment.

In Malaysia, BD has a potentially significant impact on current utilisation of mental health services due to delay in seeking treatment, recurrent relapses or admissions, concurrent substance misuse and the need for long-term psychosocial interventions. Majority of people with BD are treated in the hospitals by psychiatrists. Subsequently, those who are stable and in full remission are being treated at the primary care clinics; however the continuity of care such as treatment compliance, blood monitoring and regular supervision are lacking due to various limitations. The patients may first been seen in primary care setting and thus it is important for primary care physicians to recognise and refer accordingly.

Screening

BD is frequently mistaken with other psychiatric problems especially when patients often present with prominent depressive symptoms initially. A few tools have been identified to screen for BD [(e.g. Mood Disorder Questionnaire (MDQ), Bipolar Spectrum Diagnostic Scale (BSDS), Hypomania Checklist (HCL-32)], however their applicability in primary health care settings are limited. For example, the use of MDQ has been studied at the psychiatric outpatient clinics only. Thus, it's difficult to generate inference on its applicability in primary care. However, it may facilitate the doctors to suspect BD early and refer the patients for further psychiatric evaluation.

Diagnostic criteria for BD

BD is an illness characterised by patients experiencing recurrent mood episodes. The diagnosis necessitates the presence of mania or hypomania apart from depressive episodes. An episode is defined as a distinctive period of mood disturbance fulfilling the diagnostic criteria (Table 1). An interval of at least two months free of symptoms is required to distinguish between episodes.

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Table 1. Diagnostic Criteria for BD

Mania	Depression
Symptoms • Increased energy • Over-activity • Reduced sleep • Inflated self-esteem • Grandiose ideas • Loss of social inhibitions ± psychotic symptoms (delusions or hallucinations) Symptoms persist **at least 1 week.** In **hypomania**, symptoms are milder, without psychotic symptoms and of shorter duration.	Symptoms • Low mood • Loss of interest and enjoyment • Reduced energy and activity • Poor concentration • Sleep disturbance • Change in appetite • Feeling worthless or guilty • Psychomotor retardation or agitation • Thoughts of death, suicidal ideas or acts ± with or without psychotic symptoms (delusions or hallucinations) Symptoms persist **at least for 2 weeks.**
BD I*: • requires at least one manic episode • doesn't require depressive episode • manic symptoms of at least one week duration • symptoms severe enough to cause impairment of functions Hypomania may occur in BD I but not required to make a diagnosis.	
BD II*: • requires hypomanic symptoms and at least one major depressive episode • manic symptoms never documented • hypomanic symptoms of at least four days duration • hypomanic symptoms not severe enough to cause major impairment of functions Patients may have only one episode of hypomania with recurrent major depression	

* *It may not be critical to differentiate between BD I and II at primary care. Many patients with BD II are being misdiagnosed as major depressive disorder, hence inadequate treatment may cause chronicity. Treatment at primary care of all BD cases emphasises on maintaining remission after acute care.*

Referral criteria

Newly diagnosed or undiagnosed people with BD should be referred to psychiatric services. People with BD on maintenance treatment can be managed at primary care level. However, certain individuals need more specialised psychiatric care due to:

- acute exacerbation of symptoms
- decline in functioning
- increased risk of harm to self or others
- treatment non-adherence
- inadequate response to treatment
- ambivalence about or wanting to discontinue medication
- concomitant or suspected substance misuse
- complex presentations of mood episodes
- psychoeducational and psychotherapeutic needs

Admission criteria

The criteria for admission of people with BD are based on the Malaysian Mental Health Act 2001 (Act 615) and Regulations which are:-

- risk of harm to self or others
- treatment is not suitable to be started as outpatient such as patients who are physically violent and those who require close monitoring with multiple medications, serious side effects or frequent blood monitoring

Management

Management of BD can be divided into acute and maintenance phase. Patients in acute phase are usually managed in hospitals until their conditions are stabilised. It is very important to ensure the continuity of care for these patients in order to

prevent relapse and optimise functionality. Continuing care can be provided at the primary care clinics. There is no consensus on the duration of treatment, however long-term care is warranted as BD is a recurrent and life-long disorder. Details of medications in maintenance phase are shown in Table 2 and Table 3. The principles of management in BD should incorporate regular monitoring of the parameters as stated in Table 4.

Table 2. Pharmacological treatment of maintenance phase

First line	
Monotherapy	Lithium, lamotrigine (limited efficacy in preventing mania), valproate, olanzapine, quetiapine, risperidone long acting injection (LAI), aripiprazole,
Combination therapy	Adjunctive therapy with (lithium or valproate) + quetiapine/ risperidone LAI/ aripiprazole,/ ziprasidone
Second line	
Monotherapy	Carbamazepine, paliperidone
Combination therapy	• Lithium + valproate • Lithium + carbamazepine • Lithium or valproate + olanzapine • Lithium + risperidone • Lithium + lamotrigine • Olanzapine + fluoxetine
Third line	
Monotherapy	Asenapine
Combination therapy	Adjunctive therapy with lithium or valproate + asenapine

Table 3. Drugs dosages and adverse effects

NAME	DOSE RANGE	ADVERSE EFFECTS
MOOD STABILISERS		
Lithium	**Acute mania:** 600 - 1800 mg/day in divided doses **Maintenance dose:** 300 - 1200 mg/day in divided doses (Desired serum level : 0.6 – 1.2 mEq/L not exceeding 1.5 mEq/L). To be used with caution and correlate clinically	Gastrointestinal (GI) upset, polyuria and polydipsia, weight gain, hypothyroidism, hyperparathyroidism
Valproate	**Acute Mania:** 600 - 2500 mg/day in divided doses **Maintenance dose:** 400 - 2000 mg/day in divided doses (Desired serum level 50 - 100 µg/mL @ 347 - 693 µmol/L)	GI upset, sedation, weight gain, tremor, thrombocytopenia, raised liver enzymes
Lamotrigine	Maintenance dose: 100 - 400 mg/day in divided doses	Skin rash, insomnia, GI upset, blurred vision, diplopia, Steven Johnson's Syndrome
ANTIPSYCHOTICS		
Quetiapine	**Acute bipolar depression:** 50 - 300 mg/day in divided doses **Acute mania:** 300 - 800 mg/day in divided doses **Maintenance** 400 - 800 mg/day in divided doses	Orthostatic hypotension (for quetiapine), somnolence, weight gain, dizziness, dyslipidaemia, hyperglycaemia
Olanzapine	5 - 20 mg/day	
Paliperidone	6 - 12 mg/day	Extrapyramidal symptoms (EPS), tachycardia, somnolence, headache, weight gain, hyperprolactinaemia
Risperidone	2 - 6 mg/day in divided doses (oral) 25 - 75 mg/2 weekly (injections)	

Table 3. Drugs dosages and adverse effects (Contineud)

NAME	DOSE RANGE	ADVERSE EFFECTS
ANTIPSYCHOTICS		
Aripiprazole	5 - 30 mg/day	Agitation, akathisia, headache, insomnia, anxiety
Haloperido	3 - 30 mg/day	EPS, hypotension, akathisia, cardiac abnormalities
Asenapine	10 - 20 mg/day sublingually in divided doses	Bitter taste, oral hypoesthesia, akathisia, EPS, somnolence

Table 4. Parameters for regular monitoring

Parameter	For all patients at first visit	Antipsychotics	Lithium	Valproate	Carbamazepine
Body mass index (BMI) and waist circumference	Yes	At initiation and every 3 months for first year; more often if patient gains weight rapidly	At initiation and when needed if the patient gains weight rapidly	At initiation and at 6 months if patient gains weight rapidly	
Blood pressure	Yes	At every visit			
Fasting blood sugar	Yes	At initiation and at 3 months (1 month for olanzapine); more often if levels are elevated			
ECG	If indicated by history or clinical picture	At initiation if there are risk factors for or existing cardiovascular disease	At initiation if there are risk factors for or existing cardiovascular disease		
Full blood count	Yes		Only if clinically indicated	At initiation and 6 months	
Thyroid function	Yes		At initiation and every 6 months, more often if evidence of deterioration		
Renal function	Yes		At initiation and every 6 months; more often if there is evidence of deterioration or patients on other medications such as anticholinesterase inhibitors, diuretics or Non steroidal anti-inflammatory drugs		Urea and electrolytes every 6 months
Liver function	Yes	At initiation and when necessary		At initiation and 6 months	
Lipid profile	Yes	At initiation and at least yearly; more often if levels are elevated			

Table 4. Parameters for regular monitoring (Continued)

Parameter	For all patients at first visit	Antipsychotics	Lithium	Valproate	Carbamazepine
Drug serum level			1 week after initiation and 1 week after every dose change until level stable, then every 3 to 6 months	Every 6 months. Only if there is ineffectiveness, poor adherence or toxicity	
Serum calcium level			At initiation and yearly		

Psychosocial interventions

Psychological approaches in preventing relapse in patients with BD have been proven to enhance symptomatic outcomes and the quality of life. They are such as Cognitive Behavioural Therapy, Interpersonal Social Rhythm Therapy, Group Psychoeducation/Group-based Psychotherapy, Family-oriented Interventions and Early Warning Signal.

Summary

BD is a life-long illness. Hence, the collaborative effort between mental health professionals and primary care providers are fundamental in ensuring comprehensive care for people with the condition. Primary care physicians have important role in the management of BD especially in maintenance phase.

Acknowledgement

Details of the evidence supporting these recommendations can be found in Clinical Practice Guidelines on the Management of Bipolar Disorder in Adults (2014), available on the following website: Ministry of Health Malaysia: http:// www.moh.gov.my and Academy of Medicine: http://www.acadmed.org.my. Corresponding organisation: CPG Secretariat, Health Technology Assessment Section, Medical Development Division, Ministry of Health Malaysia and contactable at htamalaysia@moh.gov.my.

CASE REPORT

Primary tuberculosis of palate

Chen IHK, Jamal S, Pua KC

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Abstract

Primary tuberculosis (TB) of the hard palate is very rare. A 74-year-old man was presented with 6-month history of dysphagia along with an irregular mass in the hard and soft palate. Magnetic resonance imaging (MRI) revealed thickened and increased signal intensity within hard and soft palate. Tissue biopsy showed focal caseating granulomatous-like lesion and the histochemical staining using Ziehl–Neelsen stain for acid-fast bacilli was positive. Positive histochemical studies provided evidences that the hard palate mass was most likely due to TB. Thus, the patient was started on antituberculous therapy.

Introduction

Tuberculosis (TB) is a life-threatening infectious disease with a high world incidence. It is mainly caused by *Mycobacterium tuberculosis* strain of acid- and alcohol-fast bacilli of Mycobacteriaceae family and relatively less by *Mycobacterium bovis*, *Mycobacterium microti* and *Mycobacterium africanum*.[1]

Pulmonary TB is the most common form of the disease. However, it can also occur in the lymph nodes, meninges, kidneys, bone, skin and oral cavity.[2] Both primary and secondary types of TB can cause lesion in the oral cavity. In secondary TB, lesions of the oral cavity may accompany lesions in the pharynx, lungs, lymph nodes and skin.[3]

TB with oral expression is considered rare. When oral lesions of TB are the sole manifestations of the disease, the clinician may face a diagnostic challenge. The importance of recognising this entity lies in its early diagnosis and treatment, as it can be easily confused with neoplastic or traumatic ulcers.

Case report

A 74-year-old man presented to us with a history of odynophagia along with dysphagia to solid food for 6 months. He had a history of lesion on the hard palate. It initially started like an ulcer and gradually increased in size. There was intermittent fever, loss of appetite and weight. He denied night sweats. He was a chronic smoker (50 pack years), there was no history of TB contact and on examination, BCG scar was absent. Intraorally, his oral hygiene was graded as poor with moderate deposits of stains throughout the dentition. Soft tissue examination revealed an irregular mass occupying the hard and soft palate crossing midline. On palpation, the mass was tender with indurated margin and it bled on touch. The mass was extending into the left alveolar ridge, left trigone and uvula (Figure 1). The right alveolar ridge and trigone were not involved and examination of the tongue and floor of the mouth were unremarkable. Correlating these features of a chronic ulcerative lesion of 6 months duration with an associated history of smoking and advanced age, a differential diagnosis of malignant neoplasm like squamous cell carcinoma and lymphoma, TB and mycotic ulcer was arrived at. Flexible nasopharyngolaryngoscopy of the nose and larynx were unremarkable. MRI of the neck and thorax revealed thickened and increased signal intensity within hard and soft palate with no evidence of cervical lymphadenopathy, focal lung nodule or metastases. Summary of blood investigations on admission of the patient is shown in Table 1.

Figure 1. Oral cavity examination showing an irregular ulcerating lesion occupying the hard and soft palate crossing the midline with a sloughy surface

Table 1. Summary of blood investigations on admission

Investigations	
Haematology	
1. Full Blood Count	
• Total white blood cells count	4.5 x 10^3/UL (4.0 - 10.0)
•Haemoglobin	9.7 g/L (13.0 - 17.0)
•Platelets	175 x 10^3/UL (150 - 400)
Biochemistry	
2. Renal profile	
• Sodium	137 mmol/L (136 - 145)
• Potassium	3.6 mmol/L (3.5 - 5.1)
• Urea	8.8 mmol/L (2.76 - 8.07)
• Creatinine	202 mmol/L (62 - 106)
3. Liver function test	
• Total protein	66 g/L (66–87)
• Albumin	23 g/L (35–52)
• Globulin	42.8 g/L (20.0–36.0)
• Total bilirubin	0.5 umol/L (0.8–2.0)
• Alanine aminotransferase	26 U/L (<41)
• Alkaline phosphatase	155 U/L (40–130)
Others	
Erythrocyte sedimentation rate (ESR)	63 mm/h (3–10)
Mantoux test	Negative
Human immunodeficiency virus serology	Negative

Biopsy was done from the lesion in the hard palate under topical anaesthesia. Histopathological examination showed benign ulcer edge with focal caseating granulomatous-like lesion formed by the epithelioid histiocytes, lymphocytes and scanty multinucleated giant cells of foreign body type of the hard palate and this was suggestive of tuberculosis (Figure 2).

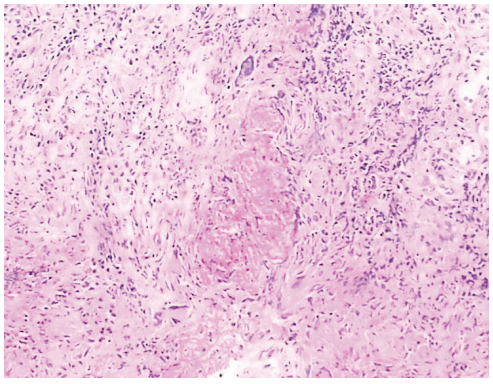

Figure 2. Focal caseating granulomatous-like lesion formed by the epithelioid histiocytes, lymphocytes and scanty multinucleated giant cells (10 × 10)

Histochemical staining using Ziehl–Neelsen stain for acid-fast bacilli was positive whereas periodic acid–Schiff stain and fungal body cultures were negative (Figure 3). There was no evidence of malignancy.

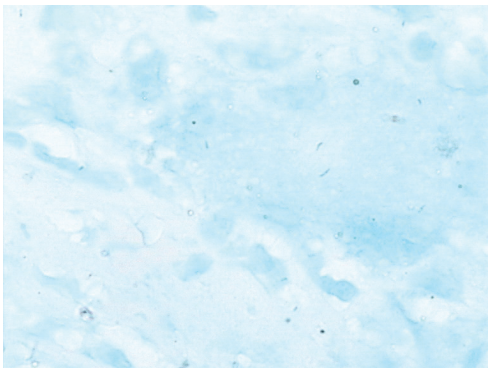

Figure 3. A multinucleated cell with engulfed bacilli (100 × 10)

In accordance with the existing guidelines, the patient was administered with antitubercular medication.

Discussion

Although TB has a definite affinity for the lungs, it can also affect any part of the body including the oral cavity. Oral manifestation of TB can be primary or secondary.[4] However, oral TB is rarely seen even in populations with high incidence of pulmonary disease.[4] Farber et al. reported that less than 0.1% of TB patients whom they had examined, exhibited oral lesions.[5] Few factors that attribute to relative resistance of oral cavity TB

are protection by the oral saliva, presence of saprophytes, resistance of the striated muscles to bacterial invasion and the thickness of the protective epithelial covering.[4]

The most common site for oral TB is the tongue. Other sites include the soft palate, hard palate, lip, cheek, tonsils, gingiva, floor of the mouth, uvula, and alveolar mucosa.[4] The pathogenesis of primary TB and secondary TB is different. In primary TB, there is direct inoculation of the mycobacterium due to loss of natural barrier resulting from inflammatory conditions, leukoplakia, tooth extraction, trauma and poor oral hygiene. However, in secondary TB, the bacilli reach the oral mucosa by haematogenous or lymphatic drainage.[4,6] Other predisposing factors include dental cyst, periapical granulomas, dental abscess, periodontitis and jaw fractures.[4,5-7]

Commonly, the manifestation of oral TB is an ulcerative lesion of the mucosa. The lesion may be preceded by an opalescent vesicle or a nodule that may break down as a result of caseation necrosis to form an ulcer. A typical TB lesion appears with ragged undermined edges, minimal induration and often with a yellowish apple jelly like granular base.[8] This lesion may ulcerate leaving radiating scars, which are quite characteristic.

In this case, no such gross pathology was observed. Instead, an irregular lesion with much indurated margin was seen. With no background history of TB contact and normal body parts, diagnosis was quite difficult. Interestingly, TB was diagnosed from the findings of tissue biopsy. We learned that in oral lesion, isolated TB diagnosis should be in list even though primary TB is extremely rare. Biopsy is an ultimate tool in the diagnosis of TB.

Unfortunately, this patient developed pancytopenia 2 months after treatment, cause of which unknown and thus a bone marrow aspirate and trephine biopsy (BMAT) was offered; however patient refused further diagnostic work-up and was subsequently lost to follow up.

Conclusion

Tuberculosis lesions of oral cavity can present with non-specific clinical appearance and it can mimic a malignant neoplasm. Primary lesions of TB manifest in the oral cavity as non-healing chronic ulcers. Hence, when diagnosing such lesions with non-healing tendencies, TB should be considered as differential diagnosis. A complete physical examination with diagnostic test, such as chest radiograph and tissue biopsy for histological studies must be included. An early diagnosis with prompt treatment will usually result in a complete cure.

How does this paper make a difference to general practice?

- TB with oral expression is extremely rare and when it is the sole manifestation, clinician may face a diagnosis challenge.
- Primary TB palate should be included in the differential diagnosis of chronic non-healing ulcer.
- Tissue biopsy is a must in all cases of chronic non-healing ulcer to obtain a diagnosis. In view of limited resources available in general practice setting, an early referral to tertiary center is recommended.
- TB shall not be excluded even if all other TB investigations were negative.
- TB is a curable disease; an early diagnosis is essential for prompt treatment.

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CASE REPORT

Wellen's syndrome: Challenges in diagnosis

Agarwal A, Vyas S, Kumar R

Agarwal A, Vyas S, Kumar R. Wellen's syndrome: challenges in diagnosis. *Malays Fam Physician*. 2015;10(3):35-37.

Keywords:
Wellen's syndrome, left anterior descending artery obstruction

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Abstract

Wellen's syndrome is a pre-infarction stage of coronary artery disease characterised by predefined clinical and electrocardiographic (ECG) criteria of a subgroup of patients with myocardial ischaemia. Early recognition and appropriate intervention of this syndrome carry significant diagnostic and prognostic value. We report this unusual syndrome in an elderly man who presented with recurrent angina and characteristic ECG changes as T-waves inversion in the precordial leads, especially in V2–V6 during pain-free periods and ECG obtained during episodes of pain demonstrating upright T-waves with possible elevated ST segments from V1–V4.

Cardiac enzymes were positive and coronary angiography revealed critical stenosis in the proximal left anterior descending artery. It is important to timely identify this condition and intervene appropriately as these patients may develop extensive myocardial infarction that carries a significant morbidity and mortality.

Introduction

Wellen's syndrome was first postulated by de Zwaan et al. in 1982.[1] It is characterised as a disease state in which a patient with angina demonstrates typical electrocardiographic pattern of T-wave changes associated with critical stenosis (>90%) of proximal left anterior descending (LAD) coronary artery.[2] Discovering Wellen's syndrome is imperative, as these patients are at greater risk of developing anterior wall infarction within few weeks unless intervention is undertaken urgently.[3]

Case Summary

A 60-year-old elderly man with no previous comorbidities presented to our casualty with complaints of recurrent bouts of retrosternal chest pain, radiating to the left arm, which was mostly present on exertion and subsided on rest. It occurred mostly at morning and sometime in night during sleep. Each episode lasted for 15–25 min. Associated symptoms included profuse diaphoresis, dizziness, shortness of breath and palpitations. Patient had previous episodes of chest pain on exertion, which he overlooked. He had 27-pack year smoking history. He denied any illicit drug use including cocaine. On admission physical examination, patient was afebrile, his pulse rate was 90 beats per minute, blood pressure was 140/100 mmHg, respiratory rate was 18 breaths per minute and saturation on room air (SpO_2) was 97%. Systemic examination was unremarkable.

Basic blood parameters (complete blood cell count, electrolytes, liver and renal functions) and fasting lipid profile were normal. Initial electrocardiogram (ECG) at the time of admission revealed symmetrical and deeply inverted T-waves in precordial leads, especially in V2–V6 during pain-free periods (Figure 1A) and ECG obtained during episodes of pain that occurred after 24 h of admission; demonstrated sharpened upright T-waves with elevated ST segments from V1–V4 (Figure 1B). Cardiac biomarkers CPK-MB was 28 IU/L (normal range: 0–25 IU/L), Troponin T was 0.021 μg/L (normal range: 0.00–0.014 μg/L) and serum blood glucose level was 6.5 mmol/L. Transthoracic echocardiography showed that LAD territory was hypokinetic with moderate left ventricular systolic dysfunction and left ventricular ejection fraction (LVEF) of 40%. The patient was initially managed on anti-platelet, anti-thrombotic (subcutaneous low-molecular weight heparin), nitrates and 3-hydroxy-3-methylglutaryl-coenzyme A (HMG-CoA) reductase inhibitors (statins). A coronary angiogram (CAG) showed critical stenosis (90%) due to a thrombus in the proximal left anterior descending artery (Figure 2).

As the patient had recurrent bouts of retrosternal chest, characteristic precordial T-wave changes and critical stenosis of proximal LAD on CAG, we labeled him as having Wellen's syndrome. He was counseled for revascularisation procedure but he refused to do the same.

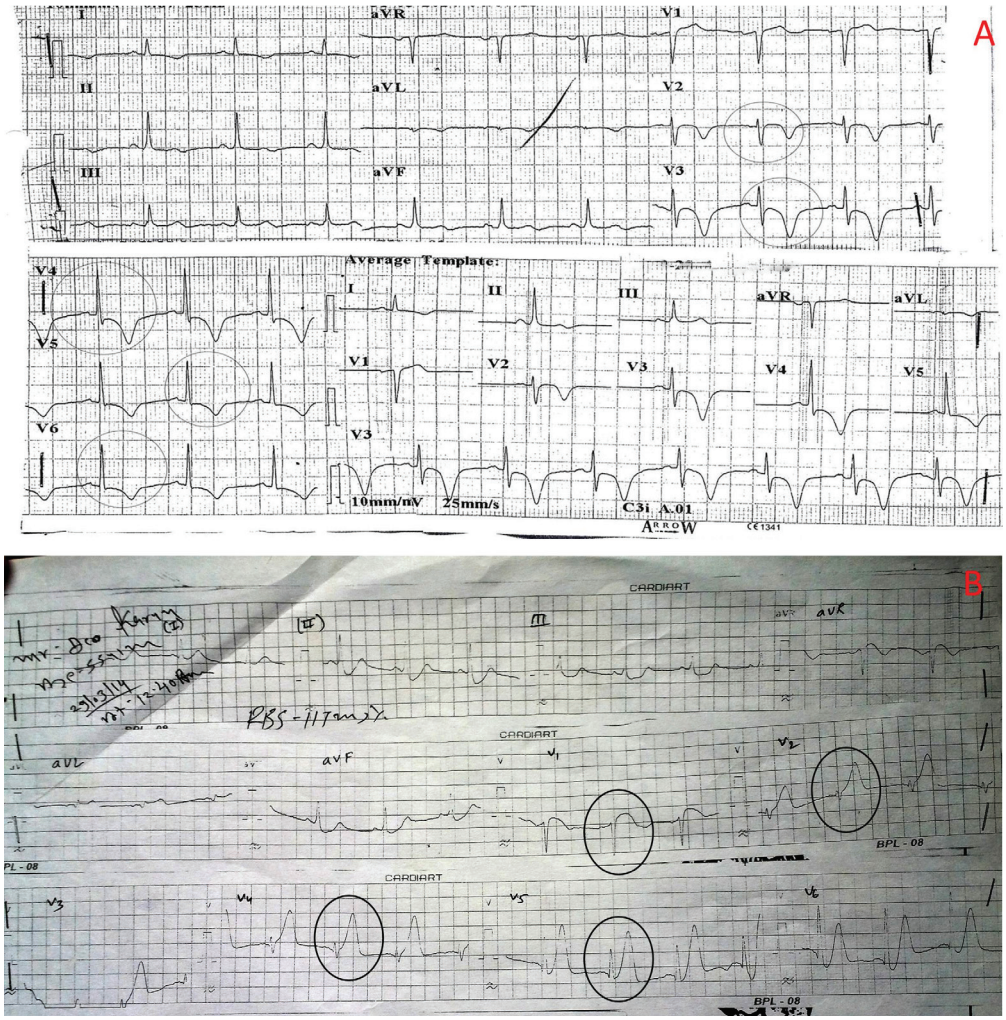

Figure 1. ECG showing deep and symmetrical T wave inversion at V2–V6 precordial leads (A); ST elevation in V1-V4 precordial leads (B)

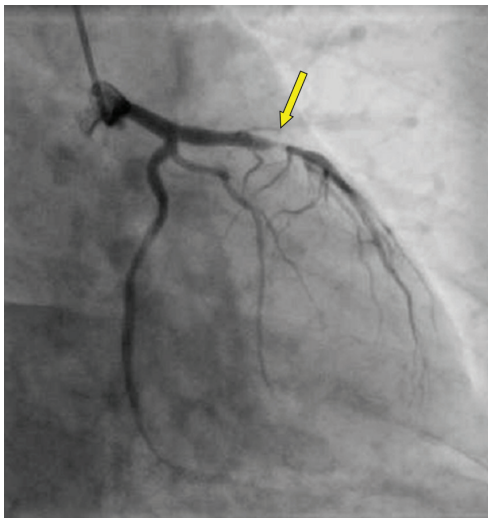

Figure 1. Coronary angiogram showing critical stenosis at the proximal left anterior descending artery

Discussion

Wellens' syndrome has characteristic ECG findings of biphasic T-waves or deep symmetrical T-wave inversions in the precordial leads (leads V1–V4). This ECG finding usually occurs during a pain-free period and is highly suggestive of critical proximal LAD coronary artery stenosis.[4] The patient also had similar T-wave inversion during pain-free period and had ST elevation on ECG during pain.

Patients often present with angina and found to have specific precordial T-wave with high-degree stenosis of the proximal LAD coronary artery.[1] Two variations of Wellen's syndrome T-wave have been notified. Type A is most common and occurs in 75% of cases. It is characterized by deeply inverted T-waves in V2 and V3. Type B occurs in 25% of cases and is illustrated by biphasic T-waves in V2 and V3.[5]

Diagnosis of this syndrome is difficult, as most of the patients do not have chest pain during the visit, have normal or minimally elevated cardiac enzymes and non-specific ECG findings. Therefore, it is important to compare serial ECGs, as this might provide clues to the diagnosis.[6]

The patient in this study had retrosternal radiating chest pain with slightly raised cardiac enzymes with ECG finding suggesting non ST elevation myocardial infraction (NSTEMI). NSTEMI in the patient was likely due to vulnerable atherosclerotic plaque in the proximal LAD coronary artery. The angiographic pattern of the disease was typical of the underlying atherosclerosis. Patient had cardiovascular risk factors, such as smoking and hypertension that we believe synergistically accelerated atherosclerosis.

Conflict of interest

None.

Source of funding

Nil.

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The many faces of bipolar disorder

Awaluddin A, Jali N, Bahari R, Jamil Z, Haron N on behalf of Development Group Clinical Practice Guidelines Management of Bipolar Disorder in Adults (2014).

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Case Summary:

A 27-year-old female, single, post-graduate student in engineering presented with worsening low mood for the past two months. She also complained of diminished interest in her studies, poor concentration in class, reduced appetite, poor sleep and lethargy. She sought treatment at the primary care clinic and was diagnosed with major depressive disorder (MDD). She was prescribed with an antidepressant and advised to attend regular follow-ups. However, she defaulted treatment and was lost to follow-up.

She presented six months later, just before her end of semester examinations. This time, she was accompanied by a friend who was concerned about her irritability and argumentative tendencies over the last week. She was more vocal, talkative and brimming with overconfidence. Her friend also noticed that she slept very little, but appeared overly energetic.

Questions

1. What is your provisional diagnosis?
2. What are the features which support your diagnosis?
3. What are the differential diagnoses?
4. How would you manage the above condition?

Answers

1. Bipolar disorder (BD) currently in manic phase.

2. She presented with two mood-related episodes, and one of which was mania. Her first presentation was consistent with MDD:
   - low mood
   - diminished interest
   - poor concentration
   - reduced appetite
   - poor sleep
   - lethargy

   She subsequently presented with mania:
   - irritability
   - increased energy
   - increased self-esteem (overconfidence and being vocal)
   - increased talkativeness
   - decreased need for sleep

   All patients presenting with mood symptoms should have organic causes ruled out. In this case, the most important differential diagnoses would be substance misuse disorder and thyroid disorders. Other psychiatric condition to be considered is borderline personality disorder.

   She has an acute episode which warrants a hospital referral. The mainstay of treatment is pharmacological which will be described further in the discussion. The treatment continuation during maintenance phase can be provided at the primary care.

Discussion

Management of BD is challenging due to the variety of clinical presentations, possibility of bipolarity and presence of comorbidities. The diagnosis is largely based on clinical presentations as well as mental state and physical assessments. International Classification of Disease and Health Related Problems 10th Revision (ICD10) categorises BD as having two or more episodes of mood disturbances, one of which has to be mania or hypomania and the other depression. An episode is defined as a distinctive period of mood disturbance fulfilling the respective criteria.

The case presented above may be familiar to many primary care physicians in which some BD patients may present initially with a depressive phase. Many of them are then diagnosed with MDD and treated

with antidepressants. Studies have found approximately 15% of patients with current episode of MDD are actually suffering from BD. The risk factors of bipolarity in patients currently presenting with MDD include:

- at least two mood episodes in the past
- a family history of mania
- occurrence of first psychiatric symptoms before of the age of 30
- current depressive episode lasting less than one month
- mood lability with antidepressants
- current mixed state

Duration of pharmacological treatment during acute phase depends on clinical response and tolerability to the treatment. In mania, the main pharmacological agents are mood stabilisers and antipsychotics. For acute depression, short-term antidepressants are used as adjunctive treatment to mood stablilisers. Treatment with antidepressants alone is not recommended for people with BD. The pharmacological treatment of acute mania consists of a variety of medication, ranging from classical mood stabilisers to atypical antipsychotics such as lithium, valproate, quetiapine and olanzapine.

In addition to pharmacological treatment, the use of psychosocial interventions such as cognitive behaviour therapy, psychoeducation and family based interventions significantly improve treatment adherence.

The key message in this case is to consider bipolarity in some people presenting with major depressive episode. Such cases need to be referred to the psychiatric services for further management.

Acknowledgements

This case is based on Clinical Practice Guidelines on the Management of Bipolar Disorder in Adults (2014), available on the following website: Ministry of Health Malaysia: http:// www.moh.gov.my and Academy of Medicine: http://www.acadmed.org.my. Corresponding organisation: CPG Secretariat, Health Technology Assessment Section, Medical Development Division, Ministry of Health Malaysia and contactable at htamalaysia@moh.gov.my.

Dark fingernails

Visuvanathan VV, Koh KC

Visuvanathan VV, Koh KC. Dark fingernails. *Malays Fam Physician.* 2015;10(3);40-42.

Keywords:
melanonychia, longitudinal melanonychia, Zodivudine

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Case summary

Madam S, a 40-year-old woman of South Asian origin was diagnosed with HIV infection through spousal contact tracing. Her husband, who had a history of intravenous drug use, was diagnosed with HIV infection while incarcerated in a prison. She was asymptomatic and had no clinical evidence of opportunistic infections. Her CD4 cell count was 180 cells/mm^3. Based on the Malaysian national guidelines for the treatment of adults with HIV-infection, Madam S was commenced on cotrimoxazole (Bactrim) tablets for prophylaxis against *Pneumocystis jiroveci* infection and a combination of antiretroviral (ARV) agents consisting of zidovudine (AZT), lamivudine (3TC) and efavirenz (EFV) to treat her HIV infection.

After 3 months, Madam S returned for the follow-up at the infectious diseases clinic. She was tolerating her ARV regime well with minimal side effects. She complained of fingernail colour changes (Figures 1 and 2), which were aesthetically distressing to her. Almost all her fingernails were noted to have longitudinal bands of hyperpigmentation. However, her toenails were spared and there was no hyperpigmentation of mucosa membranes and palmar creases.

Figure 1. Hands of the patient

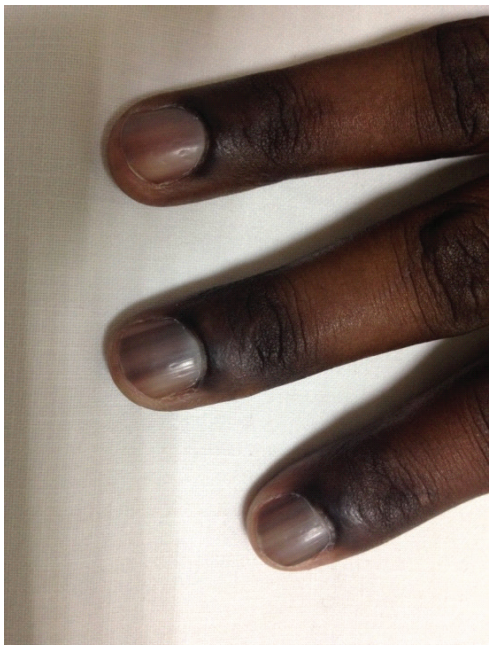

Figure 2. Pigmentation on fingernails of right index, middle and ring finger of the patient

Questions

1. What is the most likely diagnosis of changes in the colour of her fingernails?
2. What is the most probable cause?

Answers

1. This woman has acquired longitudinal melanonychia. Melanonychia is a common condition characterised by melanin-derived light brown to black pigmentation of the nails. The three common presentations of melanonychia are (i) longitudinal melanonychia (LM) (ii) transverse melanonychia and (iii) complete melanonychia. Melanin within the

nail plate (nail) is produced by melanocytes in the nail matrix, a majority of that are normally dormant.[2] Activation of these dormant melanocytes or hyperplasia of melanocytes result in increased melanin deposition within the nail plate.

2. Being of South Asian origin with Fitzpatrick Skin type V, LM may be physiological in this woman. Melanonychia has been reported to be more prevalent in darkly pigmented individuals, where the number and width of bands increases with age.[2,3]

   However, the abrupt onset of LM involving numerous digits and temporal relation with initiation of ARV therapy suggests the possibility of drug-induced melanonychia. Zidovudine, a thymidine analogue, has frequently been implicated in the development of acquired LM.[3] Examples of other drugs associated with melanocytic activation are hydroxyurea, methotrexate, phenytoin, chloroquine, bleomycin and infliximab.[2] Cotrimoxazole, Lamivudine and Efavirenz have not been reported to cause LM.

   HIV-1 infection itself may be responsible for melanonychia. Several reports have been published regarding nail colour changes in patients infected with HIV-1 who were ARV therapy naive. In these patients, LM has been associated with mucocutaneous hyperpigmentation that was attributed to increased melanin production by melanocytes due to over-expression of melanocyte-stimulating hormone.[4,5]

   Other common causes of LM include pregnancy, repeated trauma, nail biting, chronic paronychia, onychomycosis, melanoma and Addison's disease.[2] A complete list of causes of melanonychia is depicted in Table 1.[6]

Table 1. Conditions associated with longitudinal melanonychia.[6]

Melanocytic activation	
1. Physiologic causes • Racial melanonychia • Pregnancy **2. Local and regional causes** • Repeated local trauma from poor footwear or overriding toes • Onychotillomania • Nail biting • Occupational trauma • Carpal tunnel syndrome **3. Dermatologic causes** • Onychomycosis • Chronic paronychia • Psoriasis • Lichen planus • Amyloidosis • Chronic radiation dermatitis • Systemic lupus erythematosus • Localised scleroderma • Onychomatricoma • Bowen's disease • Myxoid pseudocyst • Basal cell carcinoma • Subungual fibrous histiocytoma • Verruca vulgaris • Subungual linear keratosis	4. **Systemic causes** • Endocrine disorders (Addison's disease, Cushing's syndrome) • Nelson's syndrome, hyperthyroidism, and acromegaly • Alcaptonuria • Nutritional disorders • Haemosiderosis • Hyperbilirubinemia • Porphyria • Graft versus host disease (lichen planus-type changes accompanied by longitudinal melanonychia • AIDS **5. Iatrogenic causes** •Phototherapy • X-ray exposure • Electron beam therapy • Drug intake **6. Syndromes** • Laugier-Hunziker syndrome • Peutz-Jegher syndrome • Touraine syndrome

Table 1. Classification of conditions associated with longitudinal melanonychia (adapted from J. Andre, N. Lateur. Pigmented nail disorders) (Continue)

Melanocytic hyperplasia
1. Lentigo
2. Naevus • Congenital naevi • Acquired naevi
2. Nail apparatus in situ and invasive melanoma

Discussion

Nail and mucocutaneous hyperpigmentation can cause significant distress to patients. Benign, pigmented nails and mucous membranes are perceived to be aesthetically unacceptable by many patients.

Other than being unsightly, the presence of dark nails may be perceived as stigmata of HIV infection similar to the role of Kaposi sarcoma in the pre-ARV era and lipodystrophy in the early years of Highly Active Antiretroviral Therapy (HAART) when stavudine was commonly used. Patients on zidovudine who develop melanonychia may decide to default their ARV therapy leading to non-adherence and subsequently drug resistance. It may be wise for the physician initiating a patient on ARV therapy to consider this consequence and decide on an appropriate alternative medication for zidovudine, for example, tenofovir.

The presence of LM, when other common causes have been ruled out, should prompt the clinician to consider offering HIV-screening test to the patients who may not be aware that they are infected with HIV.

Patients who develop melanonychia should be informed that the condition is benign in nature. However, the clinician should rule out more serious conditions, for example, malignant melanoma by obtaining history and looking for physical signs suggestive of melanoma, such as: (1) discoloration bands in the nails that are wider than 3 mm and have irregular borders, (2) extension of the band into the proximal and/or lateral nail fold (Hutchinson's sign), (3) a lesion with a triangular shape, (4) nails that are split or have fissures, and (5) if the pigmentation is not homogenous.[3] In the absence of these features and other common causes, the patient should be reassured and perhaps offered an alternative regime that does not cause melanonychia. The reversal of melanonychia may take a long time and during this period usage of nail polish as camouflage may be suggested.

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A man with red pinna and yellow discharge

Misron K, Mohamad I, Nik Adilah NO, Johan KB

Misron K, Mohamad I, Nik Adilah NO, et al. A man with red pinna and yellow discharge. *Malays Fam Physician.* 2015;10(3);43-44.

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Ear auricle, Infection, Cartilage

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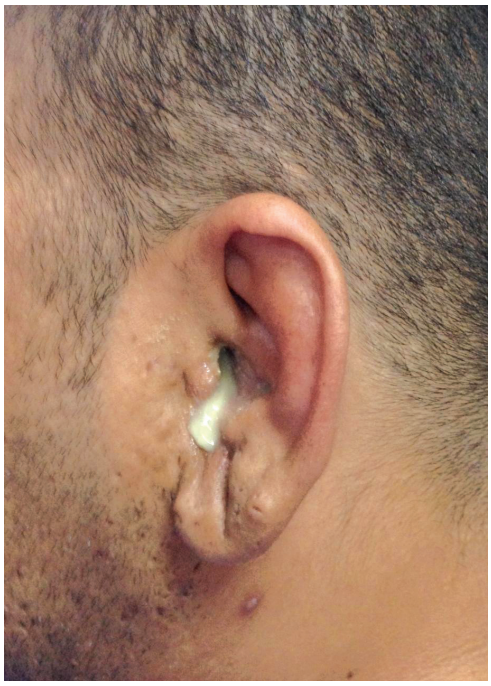
Case summary

A 38-year-old Malay gentleman, with no known medical illness, presented with the left earache and discharge for 4 days prior to admission. He also complained of reduced hearing and tinnitus over the left ear but no episode of vertigo. He initially had otalgia followed by ear discharge during the first medical consultation at a clinic. He was prescribed with oral amoxycillin-clavulanic acid 625 mg twice daily. Despite taking the medication, his condition worsened with the changes observed externally on the pinna. He gave a history of self ear-digging using metal stick into the left ear prior to these complaints.



Questions

1. What are the diagnosis and the risk factors?
2. What is the complication?
3. What should be done during the first presentation?

Answers

1. The diagnosis is left perinchondritis. The left pinna appeared inflammed sparing the ear lobule region. It was tender on palpation. There was pus discharging from the external auditory meatus.

   Otoscopic examination should reveal an inflammed and swollen external auditory canal. In its severe form, the ear canal may be completely stenosed and visualisation of more proximal structures including the tympanic membrane is unlikely. In our case, following aural toilet, the external auditory canal was oedematous and the tympanic membrane was unable to be visualised. This also explains the reduced hearing and tinnitus in the patient.

   The predisposing factor was faulty self-digging the ear canal in order to remove the wax. The instrumentation itself, plus the loss of canal protective mechanism (the skin and ear wax) are the predisposing factors to have otitis externa.[1]

2. The feared complication after a perichondritis episode is the development of the disfiguring cauliflower ear. The normal shape of the pinna will be distorted. The normal pinna is made up of cartilage with an overlying perichondrium, which gives blood supply to the cartilage and a tightly adhered overlying skin. Lifting the perichondrium off the cartilage either by oedema or any collection, such as pus or haematoma would lead to avascular necrosis to some part of the cartilage. Thus, the viable part post-infection will grow together with the fibrotic tissue causing a disfiguring external form of the ear. In this case, the ear lobule was spared because the area was deficient of cartilage. This is a typical feature of perichondritis.

3. In a patient presenting with ear discharge, ear toileting is the mainstay of treatment.

Even though the initial antibiotic provides good coverage for otitis externa infection, oral medication alone is not enough. Even if he was prescribed with topical ear drop, the effective contact surface of the instilled antibiotic with the infected area would not be optimised due to presence of the thick pus accumulated in the canal. The suboptimal treatment was the main reason of progression of the unresolved otitis externa to perichondritis. A patient with early sign of perichondritis should be closely monitored and admitted for observation of early complication, regular ear toilet on top of ensuring good compliance to antibiotics, both intravenous and topical to prevent further damage to the ear.

Upon admission, the patient was started on intravenous ciprofloxacin 400 mg twice daily and ear wick soaked with ofloxacin ear drop and prednisolone 0.12% inserted into the left ear. Ciprofloxacin is the drug of choice of a complicated ear infection, including perichondritis and malignant otitis externa. It is mainly due to of its penetration into the bone and cartilage, though the highest concentration can be found in the bile, lungs, kidney, gallbladder, uterus, seminal fluid, prostatic tissue and fluid, tonsils, endometrium, fallopian tubes and ovaries.[2]

The oral ciprofloxacin also provides a good absorption of 50%–80%[2] if the patient has been seen in an outpatient clinic or discharge upon resolution of the symptoms. In this case, his symptoms resolved after 4 days of changing the antibiotic.

In cases of severe swelling of the external auditory canal, it is advisable to insert an ear wick to facilitate the delivery of topical medications.[3] Once the ear wick is in place, the topical ear drops are placed on the external end of the wick to be distributed to the walls of the external auditory canal. The ear wick should be removed or changed after 2 to 3 days until the oedema subsides.

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