

Malaysian Family Physician

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Official Journal of the Academy of Family Physicians of Malaysia
and Family Medicine Specialist Association

2016 Volume 11 No. 2 & 3



- Implementing standard setting into the Conjoint MAFP/ FRACGP Part 1 examination – process and issues
- Diabetes risk assessment among squatter settlements in Pakistan: A cross-sectional study
- Management of neonatal jaundice in primary care



PP2089/12/2012 (031677)
ISSN :
1985-207X (Print)
1985-2274 (Electronic)



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- Books and other monographs: Personal Author(s) Stewart M, Brown JB, Weston WW, et al. Patient-Centered Medicine: Transforming the Clinical Method. Thousand Oaks, California: Sage Publications; 1995.
- Books and other monographs: Corporate Author WONCA International Classification Committee. International Classification of Primary Care, ICPC-2. 2nd ed. Oxford: Oxford University Press; 1998.

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Integrity in research and publication

Liew SM

Editor-in-Chief

It is the end of 2016 and as I sit here writing this editorial, I am reminded of the significant events that have occurred this year. Integrity was a theme that stood out this year, not just in politics but also in the scientific world.

Integrity is vital to scientific research and publication. Most of us view the pursuit of new knowledge and its dissemination as the key to progress. We understand that this can only occur when researchers and authors uphold the principles of ethics and truth. But reviewers and editors also play an important role in this. They have to critically appraise manuscripts and this takes time and hard work but has to be done. And they have to be just and not swayed by personal biases and other conflicts of interests.

Ensuring complete scientific integrity for the journal may not be possible but this is something we should always strive for. (1,2) The Malaysian Family Physician has attempted to do so by following COPE guidance (Committee On Publication Ethics. Accessible at <http://publicationethics.org/>) and taking other measures such as the use of plagiarism checker software.

I would like to take this opportunity to thank our wonderful team of reviewers and editors who have worked hard this year. I hope that this spirit of integrity will always be present at the Malaysian Family Physician.

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Implementing standard setting into the Conjoint MAFP/FRACGP Part 1 examination – Process and issues

Chan SC, Mohd Amin S, Lee TW

Chan SC, Mohd Amin S, Lee TW. Implementing standard setting into the Conjoint MAFP/FRACGP Part 1 examination – Process and issues. *Malays Fam Physician*. 2016;11(2 & 3):2–8.

Keywords:

Standard setting, modified Angoff method, Conjoint MAFP/FRACGP examination

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Abstract

Background: The College of General Practitioners of Malaysia and the Royal Australian College of General Practitioners held the first Conjoint Member of the College of General Practitioners (MCGP)/Fellow of Royal Australian College of General Practitioners (FRACGP) examination in 1982, later renamed the Conjoint MAFP/FRACGP examinations. The examination assesses competency for safe independent general practice and as family medicine specialists in Malaysia. Therefore, a defensible standard set pass mark is imperative to separate the competent from the incompetent.

Objective: This paper discusses the process and issues encountered in implementing standard setting to the Conjoint Part 1 examination.

Discussion: Critical to success in standard setting were judges' understanding of the process of the modified Angoff method, defining the borderline candidate's characteristics and the composition of judges. These were overcome by repeated hands-on training, provision of detailed guidelines and careful selection of judges. In December 2013, 16 judges successfully standard set the Part 1 Conjoint examinations, with high inter-rater reliability: Cronbach's alpha coefficient 0.926 (Applied Knowledge Test), 0.921 (Key Feature Problems).

Introduction

The College of General Practitioners of Malaysia was established in 1973. In 1979, it held its first membership examinations leading to the award of the Member of the College of General Practitioners (MCGP). This was the first higher professional examination in the discipline of general practice/family medicine in Malaysia. Since 1982, with the participation of the Royal Australian College of General Practitioners (RACGP), the examination became the Conjoint MCGP/Fellow of Royal Australian College of General Practitioners (FRACGP) examination. With the formal recognition of the College in 1996, it was renamed as the Academy of Family Physicians of Malaysia (AFPM), and the examination was renamed as the Conjoint MAFP/FRACGP examinations.¹

The Conjoint MAFP/FRACGP examination is a high-stakes postgraduate family medicine examination as successful candidates awarded MAFP/FRACGP are recognised as specialists in family medicine registerable under the National

Specialists Register of Malaysia since 2006. The Part 1 examination consists of Applied Knowledge Test (AKT) with 150 multiple choice questions (70 single best questions and 80 extended matching questions) and Key Feature Problems (KFP) with 26 clinical problems. Questions are contributed by both AFPM and RACGP.

Before the Malaysian Ministry of Health's (MOH's) recognition of family medicine specialists and the setting up of a Malaysian National Specialist Register, the numbers taking the examination were small; mainly general practitioners (GPs) who were interested to improve themselves. However, with the recognition given, there are increasing numbers of candidates, including primary care doctors from MOH.

A standard or cut point in an assessment is a score that divides those who perform well enough to pass and those who do not.² Relative standards that involve ranking are commonly used to select the highest scorers for medical school entry when places are limited. Absolute standards are used for tests of competence, to establish whether

the candidates know enough of the particular subject assessed. Absolute standards using a fixed pass mark is easy to use and can be applied to different forms of assessments. The judges are also comfortable in using it. However, it does not take into consideration the difficulty of examination items. If the test items are very difficult, it is possible for the competent candidates to fail. On the other hand, a very easy assessment will allow less competent candidates to pass. As such, the modified Angoff method has been used to standard set high-stakes examinations.

Prior to standard setting, a fixed passing mark of 66% was used. In keeping with RACGP³ and with the increasing number of candidates, the Board of Examiners (BOE) of AFPM decided in 2011 that standard setting for the Conjoint Examination is imperative for a defensible pass mark. In preparation for the introduction, training sessions were initiated from 2011. The modified Angoff method was selected as it has been successfully used in high-stakes examinations^{2,4-7} and is the method used by the RACGP in their examinations.⁸

In this method, a group of judges must first define the characteristics of a hypothetical borderline candidate, then determine how the borderline candidate would answer each test item and estimates the proportion who would get it correct. Each judge independently standard sets the test items. The group then comes together to discuss each test item. The judges can change their scores. The judges' final estimates are averaged for each item and the sum of these averages is the pass mark or cut score. This paper discusses the process and issues encountered in training and implementation of standard setting into the Conjoint Part 1 examinations using the modified Angoff method.

Methods

The first standard setting training session in 2011 was conducted by an invited external speaker and the first author, who is a senior examiner of the BOE. Both have vast experience in standard setting in the undergraduate programme examinations in the Royal College of Medicine Perak. For most of the participants, this was their first exposure to standard setting and to the modified Angoff method.

For the subsequent workshops, the participants were selected based on age, gender, place of work and willingness to participate in standard setting.^{2,5} Downing et al.⁵ emphasised the important characteristics such as knowledge of target population, content expertise, fairness, open mindedness, unbiased attitude, willingness to follow instructions and understanding the task as judges, and also the importance of balancing the panel of judges with demographic variables such as ethnicity, gender, geography and subspecialisations with practical considerations playing a major role in judge selection. Norcini² suggested that the judges should be a mixture of "teacher, practitioner, generalist and specialist" depending on test purpose and stated the importance of a balance of personal attributes like gender, race and age to avoid real or perceived conflicts of interest.

As such the participants for subsequent workshops were selected from members of the AFPM BOE based on the attributes mentioned above. The majority (76%) were full-time practising family physicians from both the private and public sectors and a minority (24%) were academic family medicine specialists. Their places of practice were from all over Malaysia. They were of both genders, different ethnic groups and of different age groups (ranging from trainee examiners to senior examiners). They formed the pool of judges for the panel of standard setters for the Part 1 Conjoint examination (see **Table 1**).

In 2012, the second workshop concentrated on standard setting AKT. In 2013, the third workshop covered both AKT and KFP.

Prior to the second and third workshops, the participants were given introductory articles on standard setting for prereading to ensure they had some knowledge on standard setting. During the workshop, the participants were briefed on the modified Angoff method and on the characteristics of a borderline candidate, followed by hands-on exercises with past year's questions. Participants independently standard set the past year's AKT and KFP, followed by a group discussion led by a moderator. The judges with the highest and lowest scores for each test item were requested to give the reasons for their respective scores. All the judges were allowed to join the discussion and to alter their standard set scores. The mean of the revised scores of each test item

was summed to get the cut score or passing mark. Reality checks in the form of actual candidates' performance in past year's test items were provided whenever the judges' scores differed widely from the actual performance. This was done not to influence the judges' scores towards the candidates' performance but used for training in situations when the facilitator felt that the judges held unrealistic views/wrong concepts, for example, equating a borderline candidate to an average or distinction candidate or on the other extreme, thinking very lowly of all borderline candidates' performance. Another issue was a tendency for some participants to think of how borderline candidates should perform without appreciating the difference between "will" perform and "should" perform.⁵ Reality checks are also used by RACGP but as a final step in standard setting their actual examination. In standard setting the actual Conjoint examination, reality checks are not used at all as the standard setting is done simultaneously as the actual examination and the papers have not been marked yet and the results are not known. During the training sessions, the standard setting was done on the past year marked actual examination questions with item analysis done and the percentages of candidates correctly answering all questions known.

At the end of the workshop, the judges were asked to feedback by bringing up any issues encountered. After the third workshop, all felt

that a detailed guideline on the characteristics of the borderline/minimally competent candidate was required. It was decided that after the workshop the judges would continue the discussion via email. Based on their feedback obtained through email communication, a detailed guideline on the characteristics of the borderline/minimally competent candidate was produced and circulated together with a section on how to score AKT. The facilitators of the second and third workshops also sent a written feedback report to the Head (chief examiner) of the BOE.

In December 2013, 16 judges selected from the workshop participants' standard set the Conjoint Part 1 examination, over a period of 2 days. This was held concurrently with the actual Part 1 examination to prevent the leakage of questions. Selection criteria for the judges again encompassed the characteristics such as age, gender, place of work and willingness to participate as mentioned above^{2,5} (see **Table 1**).

The standard set scores of the judges, before and after discussion, were analysed using the Statistical Package for Social Sciences version 17.0 (SPSS Inc, Chicago, IL) for inter-rater reliability (Cronbach alpha coefficient). Variability between the judges' scores was measured by the range in percentage between the highest and lowest total scores of the judges obtained in AKT (for 150 items) and KFP (26 cases).

Table 1. Demographic characteristics of judges in part 1 conjoint exam. December 2013

Characteristics of judges	Number of judges N = 16	Percentage
Place of practice		
i) Full-time practising	12	75
a) in private family practice clinics	9	56
b) in MOH as family medicine specialist	3	19
ii) Academic family medicine (university based)	4	25
Seniority of examiners		
i) Senior examiner	5	31
ii) Examiner	7	44
iii) Trainee examiner	4	25
Gender		
i) Male	9	56
ii) Female	7	44
Ethnic group		
i) Malay	5	31
ii) Chinese	9	56
iii) Indian	2	13
Age group		
i) 50 years and above	10	62
ii) 30–49 years	6	38

Results

Initially, the main issues were lack of experience in standard setting and difficulty grasping the concept and process of the modified Angoff method.

In 2013, the majority (71%) were comfortable with the process but a few still had difficulty conceptualising a borderline/minimally competent candidate. Through email communications among the participants after the 2013 workshop, a detailed guideline including a section on how to score AKT was produced and circulated among the participants. The guideline provided the background information on the Conjoint examinations and standard setting using the modified Angoff method, followed by a definition of the borderline candidate. For the Conjoint examination, the borderline candidate was defined as a “just passed” or “minimally competent” candidate and not as one “sitting on the fence with 50% chance of passing or failing”. The former is a higher standard required, as the Conjoint examination is an exit postgraduate examination, whose graduates are deemed as safe enough to practice in independent family practice and minimally competent to be a family medicine specialist in Malaysia. The main section of the guideline described the characteristics of the minimally competent candidate in history taking, communication, physical examination, diagnosis, investigations, and management skills. In the Appendix, guidelines on scoring AKT were given, which included assessing the importance of topic/ commonly encountered conditions, difficulty of questions and number of distractors. Based on these considerations, the judges would enter the proportion (ratio) of minimally competent candidates whom they thought would get the correct answer (see **Table 2**). For KFP, the judges guided by the characteristics of a minimally competent candidate in the guideline, assessed the number of points (marks) the minimally competent candidate would score in each question. **Table 2** shows a sample of questions and the judges’ standard set scores before and after discussion. The points given in each question of a case (clinical problem) were multiplied by the allotted weightage and summed to obtain the total score for each case. The maximum score equalled 12 for each case.

In December 2013, 16 judges successfully standard set the Part 1 Conjoint examinations. **Tables 2 and 3** show a sample of the judges’ standard set scores before and after discussion. Discussion among the judges after scoring

independently narrowed the variability (range between highest and lowest scores) between judges’ total scores from 14% to 11% (AKT) and 24% to 10% (KFP) overall and resulted in high inter-rater reliability with Cronbach’s alpha coefficient, which increased from 0.683 (AKT) and 0.810 (KFP) before discussion to 0.926 (AKT) and 0.921 (KFP) after discussion.

Discussion

Identified as critical to success in standard setting were 1) the judges’ understanding of the process of the modified Angoff method, 2) defining the characteristics of the borderline candidate and 3) selection of judges.

1) The judges’ understanding of the process of the modified Angoff method

The above issue was overcome by repeated workshops with hands-on exercises. The “judges” performance in the hands-on exercises was informally evaluated by senior board members experienced in standard setting. A general feedback was given as part of the discussion at the end of the workshop.

2) Defining the characteristics of the borderline candidate.

Participants initially had their own idea of the characteristics of a borderline candidate, some visualising him as an average GP in Malaysia, or as a senior medical officer in MOH. A few felt the borderline candidate should be excellent in most aspects of management.

Introducing the RACGP’s guidelines on the characteristics of borderline or minimally competent candidate was very helpful.⁸ An important issue in Malaysia was that those who passed must not only be competent safe family physicians who can work independently but must be minimally competent to function as a family medicine specialist in MOH. Previously, the Conjoint examination was aimed at certifying GPs in the private sector as safe family physicians. Since the introduction of the National Specialist Register in Malaysia and the recognition by MOH, those who passed are accepted as family medicine specialist after credentialing. Family medicine specialists in MOH have additional responsibilities of

Table 2. Judges' standard setting scores (before and after discussion) in a sample of questions from AKT paper

Item No	Judge number and standard set scores before discussion																Range (%)	Item mean
	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12	J13	J14	J15	J16		
1	0.70	0.60	0.60	0.80	0.60	0.60	0.60	0.70	0.70	0.70	0.70	0.80	0.80	0.65	0.80	0.65	20	0.69
2	0.60	0.60	0.50	0.70	0.70	0.60	0.70	0.70	0.80	0.70	0.80	0.65	0.80	0.55	0.70	0.65	30	0.67
3	0.60	0.70	0.70	0.80	0.70	0.80	0.55	0.50	0.60	0.60	0.55	0.50	0.60	0.50	0.50	0.65	30	0.62
4	0.70	0.80	0.60	0.80	0.80	0.80	0.55	0.70	0.70	0.70	0.70	0.65	0.50	0.70	0.70	0.70	30	0.69
5	0.60	0.70	0.50	0.80	0.60	0.60	0.60	0.60	0.70	0.70	0.65	0.50	0.55	0.65	0.80	0.70	30	0.64
6	0.70	0.80	0.80	0.90	0.80	0.70	0.60	0.70	0.80	0.70	0.65	0.80	0.60	0.75	0.60	0.75	30	0.73
7	0.80	0.70	0.70	0.90	0.80	0.65	0.70	0.70	0.70	0.70	0.80	0.70	0.70	0.65	0.90	0.75	25	0.74
8	0.50	0.70	0.70	0.80	0.80	0.50	0.70	0.50	0.40	0.50	0.55	0.40	0.60	0.65	0.40	0.70	40	0.59
9	0.50	0.70	0.70	0.70	0.60	0.65	0.65	0.60	0.60	0.70	0.60	0.80	0.70	0.80	0.80	0.75	30	0.68
10	0.50	0.70	0.60	0.60	0.50	0.40	0.55	0.40	0.50	0.60	0.50	0.50	0.45	0.40	0.50	0.65	30	0.52
Total	6.20	7.00	6.40	7.80	6.90	6.30	6.20	6.10	6.50	6.60	6.50	6.30	6.30	6.30	6.70	6.95	17	0.657*

Item No	Judge number and standard set scores after discussion																Range (%)	Item mean
	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12	J13	J14	J15	J16		
1	0.70	0.60	0.60	0.80	0.60	0.60	0.60	0.70	0.70	0.70	0.70	0.80	0.80	0.65	0.80	0.65	20	0.69
2	0.60	0.60	0.60	0.70	0.70	0.60	0.70	0.70	0.75	0.70	0.75	0.65	0.70	0.55	0.75	0.65	20	0.67
3	0.60	0.70	0.70	0.75	0.70	0.70	0.55	0.50	0.60	0.60	0.55	0.50	0.60	0.50	0.50	0.65	25	0.61
4	0.70	0.80	0.60	0.80	0.80	0.80	0.60	0.70	0.70	0.70	0.70	0.65	0.60	0.70	0.70	0.70	20	0.70
5	0.60	0.70	0.60	0.75	0.60	0.60	0.60	0.60	0.70	0.70	0.65	0.60	0.60	0.65	0.75	0.70	15	0.65
6	0.70	0.80	0.80	0.80	0.80	0.70	0.60	0.70	0.80	0.70	0.65	0.80	0.60	0.75	0.60	0.75	20	0.72
7	0.80	0.70	0.70	0.80	0.80	0.65	0.70	0.70	0.70	0.70	0.80	0.70	0.70	0.65	0.80	0.75	15	0.73
8	0.50	0.70	0.70	0.75	0.70	0.50	0.70	0.50	0.50	0.50	0.55	0.65	0.60	0.65	0.50	0.70	25	0.61
9	0.60	0.70	0.70	0.70	0.60	0.65	0.65	0.60	0.60	0.70	0.60	0.80	0.70	0.80	0.80	0.75	20	0.68
10	0.50	0.60	0.60	0.60	0.50	0.40	0.55	0.40	0.50	0.60	0.50	0.50	0.45	0.40	0.50	0.60	20	0.51
Total	6.30	6.90	6.60	7.45	6.80	6.20	6.25	6.10	6.55	6.60	6.45	6.65	6.35	6.30	6.70	6.90	13	0.657*

* Obtained by averaging sum of all item means.

Table 3. Judges' standard setting scores (before and after discussion) in a sample of questions from KFP paper

Item No	Judge number and standard set scores before discussion																Range (%)	Case mean
	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12	J13	J14	J15	J16		
Case 1																		
Q1	3	3	3	3	3	3	3	4	3	4	4	3	2	3	3	3	-	-
Q2	3	3	2	2	3	3	3	3	2	4	3	3	3	3	3	3	-	-
Q3	4	6	5	4	5	6	6	6	5	6	7	4	4	6	5	6	-	-
Total 12	7.72	8.65	7.28	6.82	8.18	8.65	8.65	9.7	7.28	10.60	10.17	7.72	6.67	8.65	8.18	8.65	33	8.35
Case 2																		
Q1	3	3	3	3	3	3	3	3	3	3	4	3	3	2	3	3	-	-
Q2	3	3	3	3	2	2	2	4	4	2	4	3	3	2	3	3	-	-
Total 12	7.92	7.92	7.92	7.92	6.48	6.48	6.48	9.36	9.36	6.48	10.56	7.92	7.92	5.28	7.92	7.92	44	7.74
Case 3																		
Q1	2	2	3	1	2	3	3	2	3	3	3	3	3	2	2	0	-	-
Q2	2	2	2	4	2	4	4	3	4	2	2	2	2	2	3	0	-	-
Q3	3	3	3	3	3	3	3	3	1	3	4	3	2	3	3	2	-	-
Q4	5	6	4	6	5	7	6	6	6	5	7	5	5	5	6	5	-	-
Total 12	6.57	7.10	6.03	7.40	6.57	9.13	8.60	7.55	7.40	7.17	8.83	6.57	7.17	6.57	7.55	3.87	44	7.13
Total of 3 cases	22.21	23.67	21.23	22.14	21.23	24.26	23.73	26.61	24.04	24.25	29.56	22.21	21.76	20.50	23.65	20.44	25	7.739*

Table 3. Judges' standard setting scores (before and after discussion) in a sample of questions from KFP paper (Cont'd)

Item No	Judge number and standard set scores after discussion																Range (%)	Case mean
	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	J11	J12	J13	J14	J15	J16		
Case 1																		
Q1	3	3	3	3	3	3	3	3	3	3	3	3	2	3	3	3	-	-
Q2	3	3	2	3	3	3	3	3	2	4	3	3	3	3	3	3	-	-
Q3	4	6	5	5	5	6	6	5	5	5	3	4	5	6	5	6	-	-
Total 12	7.72	8.65	7.28	8.18	8.18	8.65	8.65	8.18	7.28	9.08	7.25	7.72	7.13	8.65	8.18	8.65	16	8.09
Case 2																		
Q1	3	3	3	3	3	3	3	3	3	3	4	3	3	3	3	3	-	-
Q2	3	3	3	3	2	2	2	3	3	2	3	3	3	3	3	3	-	-
Total 12	7.92	7.92	7.92	7.92	6.48	6.48	6.48	7.92	7.92	6.48	9.12	7.92	7.92	7.92	7.92	7.92	22	7.63
Case 3																		
Q1	2	2	3	1	2	3	3	2	3	3	3	3	3	2	2	2	-	-
Q2	2	2	2	4	2	4	4	3	4	2	2	2	2	2	3	2	-	-
Q3	3	3	3	3	3	3	3	3	1	3	4	3	3	3	3	2	-	-
Q4	5	6	4	6	5	7	6	6	6	5	7	5	5	5	6	7	-	-
Total 12	6.57	7.10	6.63	7.40	6.57	9.13	8.6	7.55	7.40	7.17	8.83	7.17	7.17	6.57	7.55	7.03	21	7.40
Total of 3 cases	22.21	23.67	21.83	23.5	21.23	24.26	23.73	23.65	22.6	22.73	25.20	22.81	22.22	23.14	23.65	23.6	11	7.709*

* Obtained by averaging sum of all case means.

supervising and seeing referred cases from the medical officers in their clinics and running specialised clinics for patients with special problems such as HIV/AIDS. So, the workshop participants were asked to focus on both of these aspects when they standard set AKT and KFP. The detailed guideline on the characteristics of a borderline/minimally competent candidate together with the section to aid in marking AKT was found to be very helpful by the participants.

3) Selection of judges

The selection of the panel of judges in standard setting is very important as it has a definite impact on the cut-off score. As mentioned earlier, the judges selected included a mixture of senior to junior examiners from the AFPM BOE. All the BOE members had themselves passed the Conjoint examination and had gone through the AFPM's process of examiner selection. They were all content experts and knowledgeable of the curriculum and the examination process. All had experience in teaching undergraduate or postgraduate students either as academics

in medical faculties or mentors in the AFPM. They had demonstrated integrity and ability to work as a team. The judges were of both gender, different ethnic groups and practice background.^{2,5} They were open minded and willing to devote their time to the task. The authors felt that diversity was needed to increase the credibility of the established cut-off score. It is conceivable that age, gender and place of work may have an impact on the judges' decision on an item and greater diversity would appear to be fairer to average out differences.

In conclusion, inexperience and difficulty in grasping the concepts of standard setting and borderline candidate were successfully overcome by repeated hands-on training, provision of detailed guidelines and careful selection of judges. Standard setting using the modified Angoff method showed high inter-rater reliability with Cronbach's alpha coefficient of 0.926 for AKT and 0.921 for KFP after discussion. Standard setting has been successfully implemented in the Conjoint Part 1 examination (a postgraduate family medicine examination) from December 2013.

Acknowledgement

We would like to thank the Chief Examiner of the Board of Examiners for the permission to have this manuscript published and the members of the Academy of Family Physicians

of Malaysia who participated in the training and standard setting sessions of the Part 1 Conjoint examination. Also, special thanks to AP Dr. R Rajasingam Shanmugam for his advice and suggestions on standard setting.

How does this paper make a difference in general practice?

- This paper aims to create awareness of the Conjoint MAFP/FRACGP examinations to our colleagues in general practice.
- The Conjoint examinations not only assess competence for safe independent general practice but also provide a pathway for recognition as a specialist in family medicine in Malaysia.
- Previously fixed absolute standards were used to determine the passing mark but since 2013, standard setting has been introduced to ensure a defensible passing mark separates the competent from the incompetent, in line with the RACGP requirements.

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Diabetes risk assessment among squatter settlements in Pakistan: A cross-sectional study

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Ishaque A, Shahzad F, Muhammad FH, et al. Diabetes risk assessment among squatter settlements in Pakistan: A cross-sectional study. *Malays Fam Physician*. 2016;11(2 & 3):9–15.

Keywords:

Diabetes, diabetes risk, findrisc, screening tool

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Abstract

Introduction: Diabetes mellitus (DM) has evolved as a major public health concern worldwide, as its prevalence is increasing exponentially. Pakistan now ranks seventh among the countries with the highest burden of DM. It is expected to become one of the major causes of morbidity within the next 25 years. Therefore, finding an effective way to identify individuals at risk of developing diabetes is a necessity. The Finnish Diabetes Risk Score (FINDRISC) has proved to be an effective noninvasive screening tool for identifying individuals at risk for developing diabetes. The objective of this study was to determine the frequency of individuals who are at risk for developing DM and their risk of developing DM over the next 10 years using the FINDRISC tool.

Methods: A cross-sectional survey was conducted on 241 adults. The data were collected using the FINDRISC questionnaire followed by calculation of a summated score and analysis to determine the association between the risk factors under study and the risk of developing diabetes.

Results: Out of 241 study participants, 137 (56.8%) were men and 104 (43.1%) were women. Our study showed that 129 (53.5%) participants had low risk, 68 (28.2%) had slightly elevated risk, 27 (11.2%) had moderate risk and 17 (7%) had high risk of developing DM.

Conclusion: The general population should be educated about the importance of healthy lifestyle, with special emphases on maintaining an ideal body mass index and a low-risk waist circumference, along with daily fruit and vegetable intake and physical activity of at least 30 min/day.

Introduction

Diabetes mellitus (DM) has evolved as a major public health concern worldwide, as its prevalence is increasing exponentially. According to the World Health Organization (WHO), there are approximately 347 million people with diabetes all over the world, and due to its exponential growth, it has been estimated that DM will become the seventh leading cause of mortality worldwide by 2030. Among the deaths caused by DM, more than 80% occur in low- and middle-income countries. Thus, diabetes can have a great impact on our health system and economic productivity by contributing to absence from work, disability, premature retirement and premature mortality.^{1,2}

Without any interventions at primary level, this epidemic will continue to grow. It is

expected to become one of the major causes of disability and morbidity within the next 25 years. Immediate action is needed to control this wave of diabetes and to reverse this trend.³ This can be best achieved by identifying those at risk for developing diabetes at an early stage and then intervening by primary prevention.

According to the WHO, Pakistan has an estimated 10% prevalence of diabetes among the general population. It now ranks seventh among countries with the highest burden of DM.⁴ The most alarming prediction is that Pakistan is expected to rank fourth among the countries with the highest burden of diabetes by 2030.⁵

Therefore, finding an effective way to identify individuals at risk for developing diabetes and to prevent DM is an important public health priority.

According to Chen et al.,⁶ a diabetes risk score can be used as an initial screening step, followed by a diagnostic test including an oral glucose tolerance test (OGTT). OGTT has long been used as a screening test for diabetes, but it is not feasible at the mass level. Using a risk score may greatly reduce the number of individuals who would otherwise need to undergo an OGTT while achieving adequate sensitivity, specificity and positive predictive value (PPV).⁷ The Finnish Diabetes Risk Score (FINDRISC) was found to be an effective tool for assessing diabetes risk from previous studies. A FINDRISC score of ≥ 15 was associated with a sensitivity and specificity of 67.7% and 67.2%, respectively, PPV of 51% and a negative predictive value of 80.5% for dysglycaemia (impaired fasting glucose + impaired glucose tolerance + Type 2 DM).⁸ Keeping in view that Pakistan is a developing country where people have limited resources and most of them cannot afford to have screening tests at their own expenses, there must be a diabetes risk assessment tool to identify high-risk individuals so that these individuals can be further tested through investigations and advised to take preventive measures.

FINDRISC is a simple, noninvasive screening tool to identify at-risk individuals for type 2 DM. The efficacy of FINDRISC has been proved in previous studies and was found to be positively associated with the prevalence of prediabetes (odds ratio [OR] = 1.15) and diabetes (OR = 1.48).⁹ A recent study from India showed that 12% of the Indian population is at high risk and approximately 75% is at moderate risk for developing diabetes.¹⁰

Various risk factors for developing DM have been reported. According to American Diabetes Association and International Diabetes Federation, physical inactivity, body mass index (BMI) $> 25 \text{ kg/m}^2$, family history of diabetes, hypertension and central obesity contribute towards the development of type 2 DM.^{11,12}

To the best of our knowledge, very limited data from Pakistan are available on this topic.

Considering this issue as the need of the hour, we have conducted a cross-sectional survey in squatter settlements of Karachi, Pakistan. The objective of the study was to predict the risk of developing diabetes in the Pakistani population

over a period of 10 years. In this way, we can reduce the rate of exponential growth of diabetes in the population by doing interventions at the primary care level and hence increase economic productivity.

Methods

A cross-sectional survey was conducted including adults aged 20 years or more visiting primary healthcare centres in two squatter settlements between July and November 2014. The sample size was calculated by using WHO sample size calculator on the basis of the lowest prevalence of diabetes in Pakistan reported in previous research, which was found to be approximately 7%.¹³ The calculated sample size was 225. The data were obtained from two different squatter settlements of Karachi by means of nonprobability consecutive sampling. Ethical approval was obtained from the ethics review committee of the Department of Community Health Sciences of Ziauddin University, Karachi before the commencement of the study. All adult patients who came to the primary healthcare centres at the time of the study were approached for data collection after taking verbal consent. A total of 250 patients were approached for data collection, out of which 241 patients consented to participate, with a response rate of 96.4%. Patients with a history of DM and those who were undergoing anti-diabetic treatment were excluded from the study.

The data were collected by the doctors in outpatient clinics through an interviewer-based questionnaire. The reliability of questionnaire was tested with the Cronbach's alpha value of 0.70. This questionnaire was adopted from the Finnish Type 2 Diabetes Risk Assessment Form.¹⁰ This questionnaire was developed in the year 2001 and was rated by International Diabetes Federation as an effective patient questionnaire for diabetes risk assessment in the general population. It contains eight scored questions related to age, BMI, waist circumference (WC), physical activity, intake of fruit and vegetables, current intake of anti-hypertensive medications, family history of DM and personal history of high blood glucose level during health examination. This questionnaire gives a summated score that provides a measure of the probability of developing type 2 DM over the following 10 years with 85% accuracy.¹⁴

It also detects asymptomatic diabetes and abnormal glucose tolerance with high reliability in other populations.⁹ **Figure 1** shows the FINDRISC scoring. It classifies the patients into five risk categories according to the scores which as follows:

<7 = Low (estimated 1 in 100 will develop diabetes)
 7–11 = Slightly elevated (estimated 1 in 25 will develop diabetes)
 12–14 = Moderate (estimated 1 in 6 will develop diabetes)
 15–20 = High (estimated 1 in 3 will develop diabetes)
 >20 = Very high (estimated 1 in 2 will develop diabetes)

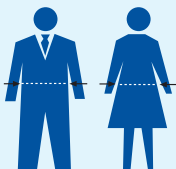
circumferences were also measured using a measuring tape to the nearest 0.1 cm. BMI, WC and waist-hip ratio were classified according to the risk categories as defined by the WHO.¹⁵ Waist-hip ratio was categorised as follows: low risk ($M \leq 0.9$ cm, $F \leq 0.85$ cm) and high risk ($M > 0.9$ cm, $F > 0.85$ cm). WC was also defined according to WHO criteria as low risk ($M < 94$ cm, $F < 80$ cm), high risk ($M = 94$ – 102 cm, $F = 80$ – 88 cm) and very high risk ($M > 102$ cm, $F > 88$ cm). WHO classification for BMI was used, where BMI between 18.5 and 24.9 kg/m² was labelled as normal, BMI between 25 and 29.9 kg/m² was labelled as overweight and BMI > 30 kg/m² was categorised as obese.¹⁶

Finnish Diabetes Association

TYPE 2 DIABETES RISK ASSESSMENT FORM

Circle the right alternative and add up your points.

1. Age 0 p. Under 45 years 2 p. 45–54 years 3 p. 55–64 years 4 p. Over 64 years	6. Have you ever taken medication for high blood pressure on regular basis? 0 p. No 2 p. Yes								
2. Body-mass index (See reverse of form) 0 p. Lower than 25 kg/m² 1 p. 25–30 kg/m² 3 p. Higher than 30 kg/m²	7. Have you ever been found to have high blood glucose (eg in a health examination, during an illness, during pregnancy)? 0 p. No 5 p. Yes								
3. Waist circumference measured below the ribs (usually at the level of the navel) <table border="0"> <thead> <tr> <th>MEN</th> <th>WOMEN</th> </tr> </thead> <tbody> <tr> <td>0 p. Less than 94 cm</td> <td>Less than 80 cm</td> </tr> <tr> <td>3 p. 94–102 cm</td> <td>80–88 cm</td> </tr> <tr> <td>4 p. More than 102 cm</td> <td>More than 88 cm</td> </tr> </tbody> </table>	MEN	WOMEN	0 p. Less than 94 cm	Less than 80 cm	3 p. 94–102 cm	80–88 cm	4 p. More than 102 cm	More than 88 cm	8. Have any of the members of your immediate family or other relatives been diagnosed with diabetes (type 1 or type 2)? 0 p. No 3 p. Yes: grandparent, aunt, uncle or first cousin (but no own parent, brother, sister or child) 5 p. Yes: parent, brother, sister or own child
MEN	WOMEN								
0 p. Less than 94 cm	Less than 80 cm								
3 p. 94–102 cm	80–88 cm								
4 p. More than 102 cm	More than 88 cm								
4. Do you usually have daily at least 30 minutes of physical activity at work and/or during leisure time (including normal daily activity)? 0 p. Yes 2 p. No	5. How often do you eat vegetables, fruit or berries? 0 p. Every day 1 p. Not every day								



Total Risk Score

☐ The risk of developing type 2 diabetes within 10 years is

Lower than 7	Low: estimated 1 in 100 will develop disease
7–11	Slightly elevated: estimated 1 in 25 will develop disease
12–14	Moderate: estimated 1 in 6 will develop disease
15–20	High: estimated 1 in 3 will develop disease
Higher than 20	Very high: estimated 1 in 2 will develop disease

Please turn over

Figure 1. FINDRISC questionnaire with scoring

Height, weight, and waist and hip circumferences of all the subjects were measured, and BMI values were calculated for each patient. Weight of the patients was measured in light clothes only using bathroom scale to the nearest 0.1 kg. Height was measured without shoes, on a flat surface to the nearest 0.1 cm using wall-mounted stadiometers. The waist and hip

The data were analysed using IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp. For continuous variables such as weight, height, BMI and waist and hip circumferences, means and standard deviations were reported. Independent-samples t-test was applied to compare the anthropometry between the two genders. Categorical variables such as demographic characteristics and risk factors (WC, waist-hip ratio, frequency of fruit/vegetable intake, history of high blood sugar levels and intake of anti-hypertensive drugs) were expressed as percentages. Chi-square test was applied as the test of significance, considering $p < 0.05$ as significant.

Results

Out of 241 study participants, 137 (56.8%) were men and 104 (43.1%) were women. This was a multi-ethnic sample, with Pathans (28.6%) and Memons (37.8%) as predominant ethnic groups. Regarding marital status, 175 (72.6%) of the participants were married. Most of the men (86%) were employed, and 81% of the women were housewives. Socio-economic status analysis showed that monthly income of the majority of the participants (71.3%) was below Pakistani Rs. 20,000 (see **Table 1**). Comparison of anthropometric parameters between men and women is shown in **Table 2**. Although men had a higher mean for weight and height, mean BMI and waist and hip circumferences for women were higher than men.

Table 1. Demographic characteristics

Demographic parameter	N	Percentage
Gender		
Male	137	56.8
Female	104	43.2
Ethnicity		
Sindhi	11	4.6
Punjabi	44	18.3
Pathan	69	28.6
Balochi	8	3.3
Urdu speaking	18	7.5
Memon	91	37.8
Marital status		
Single	62	25.7
Married	175	72.6
Widowed	4	1.7
Education		
Nil	57	23.7
Primary	57	23.7
Matriculation	65	27
Graduation	50	20.7
Post-graduation	12	5.0
Monthly income (Rs.)		
<10,000	89	36.9
10,000–20,000	83	34.4
>20,000	69	28.6
Occupation		
Employed	136	56.4
Unemployed	105	43.5
Family type		
Nuclear	101	41.9
Joint	140	58.1

Table 2. Relationship between gender and risk factors for DM

Anthropometric measures	Men Mean $\pm$ SD	Women Mean $\pm$ SD	p-Value
Weight (kg)	71.2 $\pm$ 13.5	67.4 $\pm$ 15.61	0.046
Height (cm)	170.2 $\pm$ 6.31	156.8 $\pm$ 7.09	<0.001
BMI (kg/m ²)	25.0 $\pm$ 5.17	26.8 $\pm$ 5.85	0.013
Waist circumference (cm)	86.1 $\pm$ 12.03	92.7 $\pm$ 15.43	<0.001
Hip circumference (cm)	95.7 $\pm$ 10.92	104.9 $\pm$ 15.00	<0.001
Diet and lifestyle measures		N (%)	N (%)
Physical activity >30 min	101 (73.7)	35 (33.7)	<0.001
Fruit and vegetable intake			
	• Everyday	103 (75.2)	54 (51.9)
	• Not everyday	34 (24.8)	50 (48.1)
Taking antihypertensive medications			
	• Yes	7 (5.1)	19 (18.3)
	• No	130 (94.9)	85 (81.7)
Family history of DM			
	• No	84 (61.3)	56 (53.8)
	• Yes (grandparent, aunt, uncle or first cousin)	14 (10.2)	18 (17.3)
	• Yes (parent, brother, sister, own child)	39 (28.5)	30 (28.8)

Note: Test of significance: pooled t-test

Risk factors for DM as mentioned in the FINDRISC form were analysed according to the gender of the participants. With respect to risk categories, 129 (53.5%) of the participants had low risk, 68 (28.2%) had slightly elevated risk, 27 (11.2%) had moderate risk, 16 (6.6%) had high risk and 1 (0.41%) had very high risk

of developing DM. When risk categories were further stratified according to gender, statistics were alarming. **Figure 2** shows that as the risk score increases, the percentage of female population also increases; this difference was significant ($p = <0.01$).

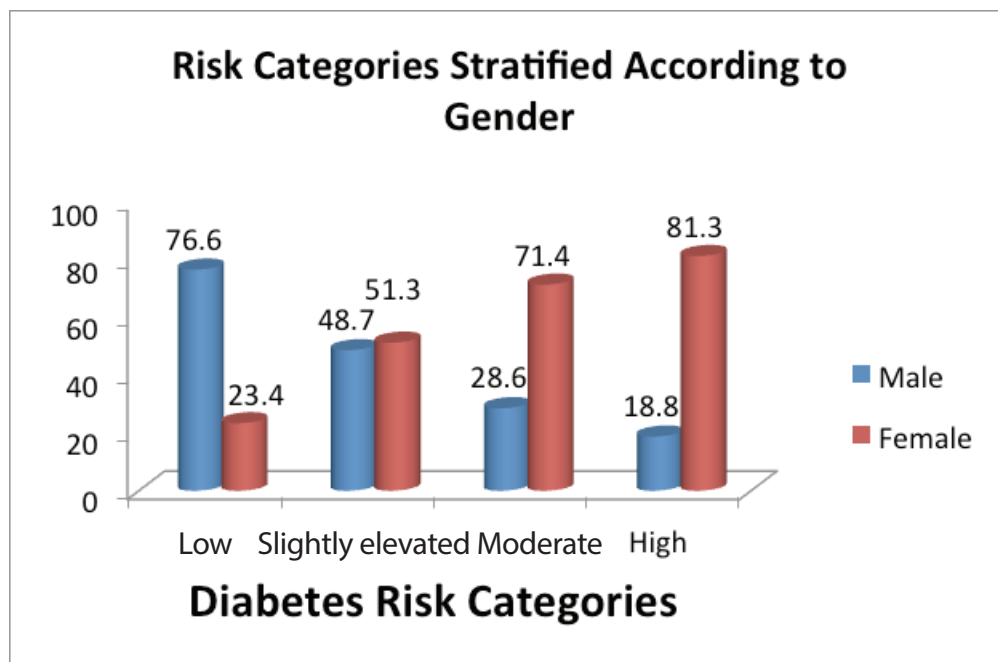


Figure 2. Risk of developing diabetes within 10 years ($p = 0.033$)

Difference in BMI was found to be statistically significant between the two genders ($p = 0.013$). Females were found to have a higher mean BMI as compared to males. In our study sample, women had a significantly higher WC and waist-hip ratio as compared to men ($p < 0.001$). A significant difference was found among men and women with respect to physical activity, daily intake of fruit and vegetable and current intake of anti-hypertensive medicines ($p < 0.01$). Positive family history of diabetes was not found to be a significant risk factor in our study.

Discussion

The FINDRISC tool was developed to identify persons at high risk for developing type 2 DM.¹⁷ In this study, we calculated the risk scores for patients in a cross-sectional setting. We used the FINDRISC tool for diabetes risk assessment in our population. This tool was previously used in a study by Saaristo et al. in 2005, and correctly identified 66% (men) and 70% (women) of previously undiagnosed patients with type 2 DM.¹⁷

Men with a WC of more than 102 cm and women with a WC of more than 88 cm were more likely to have high scores on FINDRISC ($p < 0.001$) and thus more likely to develop diabetes in future. Similar results were observed in a study by Siren et al. from Finland, where a WC ≥ 94 cm in middle-aged men was identified as a risk factor for type 2 diabetes, with a sensitivity of 84.4% (95% confidence interval [CI], 76.4–90.0%) and a specificity of 78.2% (95% CI, 68.4–85.5%).¹⁸

Majority of the men had a WC falling under low-risk category (WC < 94 cm), whereas the WC of a vast majority of women fell under high-risk category. These findings are also consistent with data from India.¹⁸

In our study population, 42% of the participants had a positive family history of diabetes, which is closer to the South Indian population.¹⁹ Among those who had a positive family history, 40% fell under moderate- to high-risk categories for developing diabetes.

The prevalence of the study participants at risk for developing type 2 diabetes within the next 10 years is shown in Figure 2. Among men, the prevalence of the participants at high risk for developing type 2 diabetes was found to be 2.9% as compared with other studies, including Wilson et al. (1.6%),¹⁹ FINDRISC (22.9%)²⁰ and Griffin et al (24.9%).²¹ The female participants in our study showed a prevalence of 12.5% for high-risk category. When compared with the results from different parts of the world, our prevalence rates were higher than those reported by Wilson (1.1%),¹⁹ Balkau et al. (2.9%)²² and Kahn et al. (6.0%).²³

A majority of studies have shown that men are more prone to develop diabetes.²⁴ However, in the present study, more women were found to be at higher risk for developing diabetes, as compared with men. The reason for this could be the lifestyle of Pakistani women, who are mostly housewives with less active lifestyle and fewer outdoor activities. Therefore, they are more likely to be obese, thus explaining the findings of high-risk scores for women as compared with men.

Since a higher proportion of our female population was found to be at risk for developing diabetes due to physical inactivity, high-risk WC and poor fruit/vegetable intake, our suggestion is that at each visit to the primary care provider, the patient should be educated about the importance of at least 30 minutes of physical activity per day along with counselling on balanced nutrition, especially the intake of four to five portions of vegetable or fruit per day, to reduce the health risks. Emphasis should also be put on reducing weight, as the greater the BMI and WC, the greater will be the risk of

developing diabetes. Another suggestion is that our female population should be given equal chances of participation in sports to enhance their activity level. This can be best achieved by creating awareness about the importance of healthy weight and adequate physical activity among school children and providing them with opportunities so that it becomes a part of their healthy behaviour.

This study is one of the preliminary studies done in Pakistan to find out at-risk population for diabetes using noninvasive risk assessment tool. The strength of this study is that, to the best of our knowledge, it is the first study of its kind in the Pakistani population. The limitation of this study is that it was only conducted in a low socio-economic group, so we do not have the data from higher socio-economic classes, where the results might have been different. Due to the nonprobability sampling method, the results of this study cannot be generalised. Another limitation of our study is that the FINDRISC tool was not validated in local language for the Pakistani population.

Conclusion

The general Pakistani population should be educated regarding the importance of a healthy lifestyle, with special emphases on maintaining an ideal BMI and a low-risk WC, along with daily fruit and vegetable intake and daily physical activity of at least 30 min/day. This would be beneficial in reducing the burden of DM in our population. Different strategies, including awareness sessions regarding lifestyle modifications, are required to sensitise the high-risk groups of our population and prevent them from developing DM in future.

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Management of neonatal jaundice in primary care

Wan ASL, Mat Daud S, Teh SH, Choo YM, Kutty FM on behalf of Development Group
Clinical Practice Guidelines Management of Neonatal Jaundice (Second Edition).

Wan ASL, Mat Daud S, Teh SH, et al. Management of neonatal jaundice in primary care. *Malays Fam Physician*. 2016;11(2 & 3);16–19.

Keywords:

Neonatal jaundice, risk factors, phototherapy, primary care, prevention

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Abstract

The Clinical Practice Guidelines on Management of Neonatal Jaundice 2003 was updated by a multidisciplinary development group and approved by the Ministry of Health Malaysia in 2014. A systematic review of 13 clinical questions was conducted using evidence retrieved mainly from Medline and Cochrane databases. Critical appraisal was done using the Critical Appraisal Skills Programme checklist. Recommendations were formulated based on the accepted 103 evidences and tailored to local setting as stated below.

Neonatal jaundice (NNJ) is a common condition seen in primary care. Multiple risk factors contribute to severe NNJ, which if untreated can lead to adverse neurological outcomes. Visual assessment, transcutaneous bilirubinometer (TcB) and total serum bilirubin (TSB) are the methods used for the detection of NNJ. Phototherapy remains the mainstay of the treatment. Babies with severe NNJ should be followed-up to detect and manage sequelae. Strategies to prevent severe NNJ include health education, identification of risk factors, proper assessment and early referral.

Introduction

Jaundice is one of the most common conditions, which needs medical attention in newborn babies. It is caused by high levels of bilirubin in the blood. Globally, about 60% of the term babies and 80% of the preterm babies develop jaundice in the first week of life. In most of the babies, early jaundice is physiological and harmless. However, some babies may develop severe jaundice, which can be harmful if left untreated. High levels of bilirubin can lead to brain damage, which may result in neurodevelopmental impairment such as cerebral palsy, and visual and hearing loss. Hence early detection of neonatal jaundice (NNJ) is very important, followed by timely referral and appropriate treatment.

An evidence-based Clinical Practice Guidelines on *Management of Neonatal Jaundice* (Second Edition) was published in 2015, which addresses the management of NNJ in the term and preterm babies excluding prolonged jaundice and conjugated hyperbilirubinaemia.

Risk factors

Risk factors of severe NNJ are as follows:

- prematurity
- low birth weight
- jaundice in the first 24 hours of life
- mother with blood group O or rhesus negative
- glucose-6-phosphate dehydrogenase (G6PD) deficiency

- rapid rise of total serum bilirubin (TSB)
- sepsis
- lactation failure in exclusive breastfeeding
- high predischage bilirubin level
- cephalohaematoma or bruises
- babies of diabetic mothers
- family history of severe NNJ in siblings

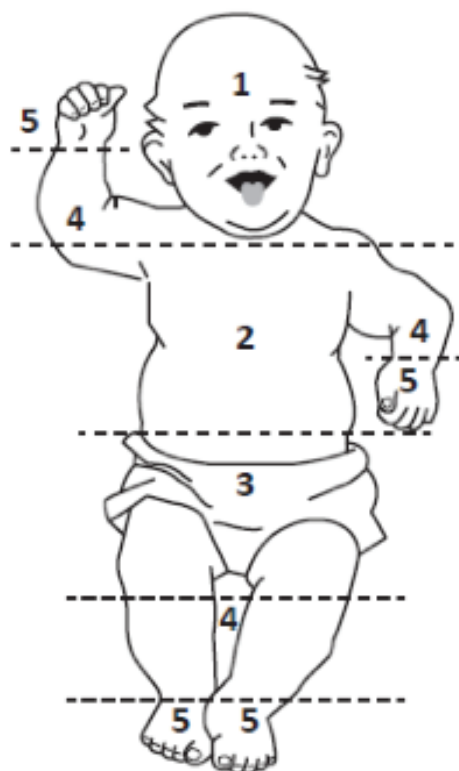
Breastfeeding, because of its benefits, should be continued in babies with jaundice. Adequate lactation/breastfeeding support should be provided to all mothers, particularly those with preterm babies. In jaundice-associated breastfed babies with inadequate intake, excessive weight loss (>10% of birth weight) or dehydration, supplementation with expressed breast milk or formula may be considered. Babies with weight loss >7% of birth weight should be evaluated and closely monitored for jaundice.

Methods of detection

All babies should be visually assessed for jaundice at every opportunity. Kramer's rule describes the relationship between serum bilirubin levels and the progression of skin discolouration (see **Table 1** and **Figure 1**). Trained primary health workers may use this as a screening tool.

Table 1. Visual assessment of NNJ (Kramer's rule)

Area of the body	Level	Range of serum bilirubin	
		μmol/L	mg/dL
Head and neck	1	68–133	4–8
Upper trunk (above umbilicus)	2	85–204	5–12
Lower trunk and thighs (below umbilicus)	3	136–272	8–16
Arms and lower legs	4	187–306	11–18
Palms and soles	5	≥306	≥18

**Figure 1.** Visual assessment of NNJ (Kramer's rule)

The transcutaneous bilirubinometer (TcB) is a hand-held device that measures the amount of bilirubin in the skin. If available, it may be used in the assessment of NNJ. Mean differences between TcB measurements and TSB levels are large when the bilirubin levels exceed 205 μmol/L (12 mg/dL).

Visual assessment and TcB should not be used to monitor bilirubin levels in the babies on phototherapy.

TSB measurement is the gold standard for detecting and determining the levels of hyperbilirubinaemia. It is used to confirm the levels of bilirubin detected from visual assessment and TcB as well as to monitor the babies on phototherapy.

Treatment

Phototherapy is the mainstay of treatment in NNJ. Phototherapy should be commenced when TSB reaches the phototherapy threshold for NNJ (see **Table 2**). Phototherapy thresholds are lower in the preterm and low birth weight babies.

Table 2. TSB levels for phototherapy and exchange transfusion (ET) in babies ≥35 weeks gestation

Age	Low risk (≥38 weeks and well)		Medium risk (≥38 weeks with risk factors or 35–37 weeks + 6 days and well)		High risk (35–37 weeks + 6 days with risk factors)	
	Conventional phototherapy	ET	Conventional phototherapy	ET	Conventional phototherapy	ET
Hours of life	TSB in mg/dL (μmol/L)					
<24*	-	-	-	-	-	-
24	9 (154)	19 (325)	7 (120)	17 (291)	5 (86)	15 (257)
48	12 (205)	22 (376)	10 (171)	19 (325)	8 (137)	17 (291)
72	15 (257)	24 (410)	12 (205)	21 (359)	10 (171)	18.5 (316)
96	17 (291)	25 (428)	14 (239)	22.5 (385)	11 (188)	19 (325)
>96	18 (308)	25 (428)	15 (257)	22.5 (385)	12 (205)	19 (325)

a Start intensive phototherapy at TSB 3 mg/dL (51 μmol/L) above the level for conventional phototherapy or when TSB increasing at >0.5 mg/dL (8.5 μmol/L) per hour.

b Risk factors are isoimmune haemolytic disease, G6PD deficiency, asphyxia and sepsis.

* Jaundice appearing within 24 hours of life is abnormal and needs further evaluation.

ET should be considered when TSB reaches the threshold levels in NNJ (see **Table 2**).

There is limited good evidence on the use of pharmacotherapy (clofibrate, intravenous immunoglobulin, human albumin and phenobarbitone) and complementary medicine in NNJ.

Referral

Babies should be referred for phototherapy if their TSB reaches the phototherapy threshold (see **Table 2**). They should also be referred to the secondary/tertiary care when they are presented with any of the following:

- onset of jaundice within 24 hours of life
- rapidly rising TSB of >6 mg/dL/day (103 µmol/L/day)
- clinical jaundice below umbilicus, corresponding to TSB of 12–15 mg/dL (205–257 µmol/L)
- clinical jaundice till the soles of the feet (urgent referral for possibility of ET)
- G6PD deficiency, if not previously hospitalised
- clinical symptoms/signs suggestive of sepsis

The overall summary on management is shown in the Algorithm on Management of NNJ.

Long-term follow-up

Severe NNJ may cause acute bilirubin encephalopathy (ABE). Babies with ABE should have long-term follow-up to monitor the neurodevelopmental sequelae (athetoid cerebral palsy, intellectual disability and high-frequency hearing loss).

Babies with severe jaundice [TSB >20 mg/dL (342 µmol/L)] or those who require ETs should have auditory brainstem response (ABR) testing done within the first 3 months of life. If the ABR is abnormal, neurodevelopmental follow-up should be continued.

Healthy babies born at 35 weeks gestation and above with non-haemolytic hyperbilirubinaemia and TSB <25 mg/dL (428 µmol/L) may be followed-up at the primary care level.

Strategies to prevent severe NNJ

- Antenatal and postnatal strategies include:
 - health education on NNJ
 - identification of risk factors
 - early detection of NNJ
 - proper assessment of babies with NNJ
 - early referral as indicated

- Late preterm, G6PD deficiency and isoimmune haemolytic disease (ABO and rhesus incompatibility) are the important risk factors for developing severe NNJ. Phototherapy thresholds are lower for babies with these risk factors.
- All babies should be screened for G6PD deficiency at birth. If G6PD is deficient, babies should be admitted and monitored for NNJ during the first 5 days of life. If they were discharged earlier, they should be followed-up closely.
- Breastfeeding should be encouraged and adequate lactation support should be provided to all mothers.
- PredischARGE screening in hospital using TcB may be considered.

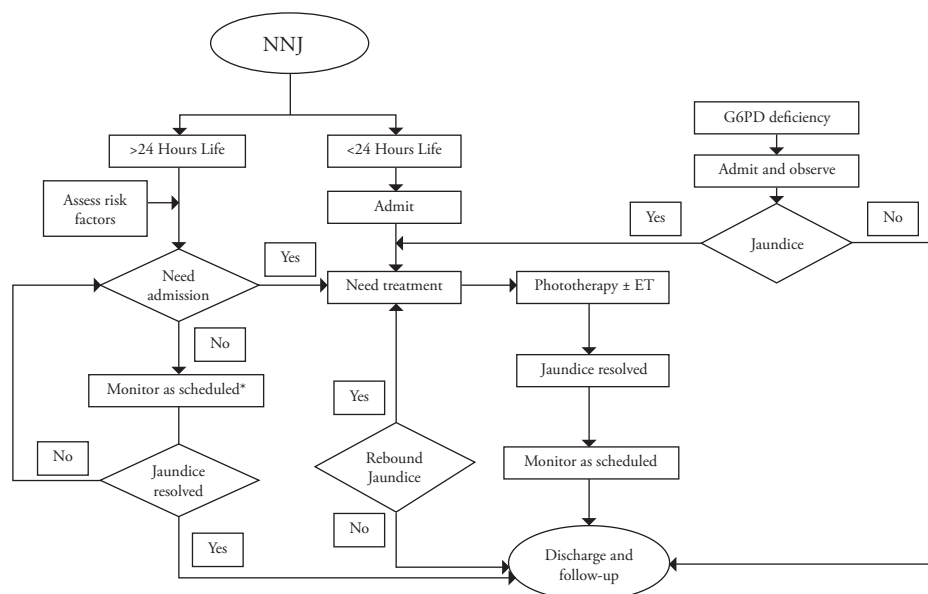
Information for parents and carers

The following advices are helpful for parents/carers on NNJ:

1. Look for jaundice daily during the first week of life.
2. Check the naked baby for jaundice in bright and preferably natural light, by blanching the skin with gentle finger pressure over the chest.
3. Presence of jaundice needs to be confirmed by healthcare providers; blood tests may be required.
4. Jaundice in the first 48 hours of life needs urgent review by healthcare providers.
5. Continue breastfeeding even if the baby is jaundiced. Contact the healthcare provider for assistance with breastfeeding if needed.
6. Untreated jaundice may lead to deafness and brain damage.
7. Phototherapy is a safe and effective form of treatment for NNJ.
8. Traditional and alternative methods of treating jaundice are unproven and likely to be ineffective.
9. Exposing the baby to sunlight as a form of treatment may be harmful due to dehydration and sunburn.

Details of the evidence supporting the above statements can be found in Clinical Practice Guidelines on the Management of Neonatal Jaundice (Second Edition) 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.

Algorithm on Management of Neonatal Jaundice



* If jaundice persists beyond 14 days in the term babies and 21 days in the preterm babies, further evaluation for prolonged jaundice is needed.

Chronic heel pain: It could be tuberculosis.

Muhamad Effendi F, Ibrahim MI, Rozali KN, Miswan MF

Muhamad Effendi F, Ibrahim MI, Rozali KN, et al. Chronic heel pain: It could be tuberculosis. A case report. *Malays Fam Physician*. 2016;11(2 & 3):20–23.

Keywords:

Calcaneum, tuberculosis, osteomyelitis, foot

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Abstract

Introduction: Heel pain is a common presentation at a primary care setting. The majority of these cases are benign and self limiting in nature. Common differential diagnoses include plantar fasciitis and peroneal muscle sprains. However, certain conditions—if undetected early—may cause significant morbidity to the patient. A high index of suspicion and early referral for further investigations are needed to prevent long-term morbidities.

Methods: A clinical review of a patient with chronic left heel pain was performed. Blood parameters and imaging investigations indicated chronic infection of the calcaneum. Histopathological examination was highly suggestive of tuberculosis.

Result: The patient responded well to antituberculous therapy. She was pain free and showed no signs of recurrence at final follow-up.

Conclusion: Here, we report a case of chronic heel pain, which was later diagnosed as tuberculosis of the calcaneum and successfully treated with antituberculous therapy.

Introduction

Foot pain is highly prevalent in primary care, with up to 63% of the population reporting stiffness or pain in their feet.¹ Of these, heel pain constitutes 14% of the reason for consultation. The majority of these cases are benign and self limiting in nature. There is a wide range of differential diagnoses, most of which are mechanical in nature and their recognition is guided by the anatomic location of pain.² Common differential diagnoses for heel pain include plantar fasciitis, Achilles tendinopathy, Haglund's deformity and peroneal tendinopathies. tuberculosis of the foot and ankle is rare, especially in an immunocompetent individual.³ The tendency to treat heel pain as a benign condition and the rarity of calcaneal tuberculosis may result in diagnostic and therapeutic delay. Furthermore, tuberculosis is known to mimic other conditions, both clinically and radiographically.⁴ Even with blood investigations and advanced imaging technique, it could be a challenging task to arrive at the diagnosis because of the non-specific findings of these investigations. Therefore, general practitioners being the frontliners in medical care should be aware that a patient presenting with unresolving chronic heel pain must be further investigated and referred to an orthopaedic surgeon for further evaluation.

Case report

We report about a 24-year-old lady with no past medical history who presented with left heel pain for 5 months duration. It was a dull, aching pain which progressively worsened over a 5-month period and subsequently started to disturb her function about 2 weeks prior to the presentation. There was no obvious history of trauma, but she admitted that the pain started when she became active in badminton. The pain was triggered by activities such as long-distance walking and prolonged standing. Upon initial visits to a general practitioner, she was diagnosed with peroneal tendinitis and was told to reduce her sporting activities and prescribed oral analgesics. The heel pain was only partially relieved with the oral analgesics and progressively became unrelenting and caused disturbance of her daily activities. She denied having fever, night sweats or constitutional symptoms such as unexplained weight loss and appetite loss. She did not have any contact with persons with known tuberculosis or chronic cough. She was afebrile at the presentation and her vital signs were stable. Examination of her left foot and ankle revealed tenderness over the lateral aspect of the ankle joint extending distally towards the heel. The tenderness became more marked with inversion of the subtalar

joint with limited range of motion. There were no sinuses or swelling observed. Blood counts revealed a raised erythrocyte sedimentation rate (ESR) of 47 mm/h and C-reactive protein of 18 mg/L, but the white blood cell count was normal. Axial and lateral view radiographs of the calcaneum showed a radiolucent area in the marrow of the left calcaneum with no periosteal reaction (**Figures 1 and 2**). Magnetic resonance imaging (MRI) demonstrated hyperintense lesions on T2-weighted images within the calcaneum with surrounding marrow oedema, suggestive of osteomyelitis (**Figure 3**). MRI also revealed a normal peroneal tendon.



Figure 1. Axial view of the calcaneum: radiolucent area (yellow arrow) adjacent to the lateral wall



Figure 2. Lateral view of the calcaneum: radiolucency (yellow arrow) within the marrow with no periosteal reaction



Figure 3. Hyperintense areas within the calcaneum (red arrows) indicating cysts with surrounding marrow oedema, suggestive of osteomyelitis

A working diagnosis of pyogenic osteomyelitis of the left calcaneum was made based on the clinical findings of tenderness over the lateral aspect of the calcaneum, laboratory results of increased level of ESR and C-reactive protein (CRP) and typical MRI findings. Surgical drainage was performed. At the operation, it was noted that there were intraosseous caseous material with multiple cystic areas in the left calcaneum, which was consistent with pyogenic osteomyelitis (**Figure 4**).

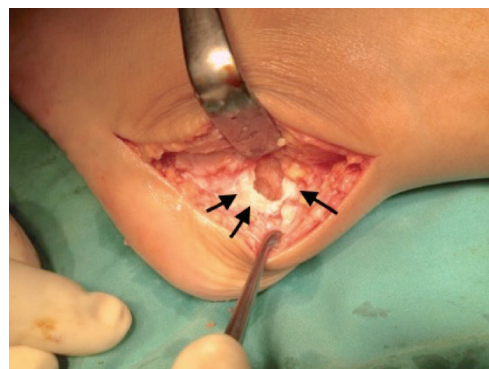


Figure 4. Intraoperative picture. Caseous necrosis, a 'cheese-like' appearance of the tissue (small black arrows) surrounding a cyst in the lateral part of the calcaneum. This is consistent with osteomyelitis

Histopathological examination of the material evacuated from the calcaneum revealed granulomatous inflammatory material with areas of necrosis. Acid-fast bacilli smear of calcaneal bone tissue was negative. She was started on antituberculous (anti-TB) treatment based on the overall clinical, biochemical and

histopathological findings. She showed good clinical response after completing a 2-months regime of ethambutol, isoniazid, rifampicin and pyrazinamide, followed by 7 months of isoniazid and rifampicin. Final follow-up at 18 months revealed she was pain free and able to perform her routine daily activities.

Discussion

Tuberculous osteomyelitis involving the foot is very rare. It represents <1% of extrapulmonary tuberculosis,³ with the calcaneum being the most frequently tarsal bone involved. Tuberculosis of the calcaneum has the ability to mimic other diseases such as Charcot's arthropathy, psoriatic arthritis, Haglund's deformity and Achilles tendinopathy because of its rarity and insidious clinical course.^{5,6} This frequently resulted in diagnostic delays,⁷ which may lead to subtalar joint collapse and secondary degenerative changes.⁶ Although our patient presented with skeletal tuberculosis symptoms such as unexplained chronic heel pain, bony tenderness and limited range of motion,⁶ these symptoms were non-specific. Furthermore, based on the location of pain, which was on the lateral aspect, it mimicked a diagnosis of peroneal tendinitis.⁸ Other symptoms that should have increased the suspicion of skeletal tuberculosis include constitutional symptoms such as fever, night sweats, unexplained weight loss and anorexia.⁶ Our patient did not manifest any of the symptoms and did not have any contact with persons affected by tuberculosis. Therefore, in this particular case, we found that it was difficult to differentiate calcaneal tuberculosis and peroneal tendinitis based on the history and physical examination. Thus, anecdotally we recommend imaging for cases with unresolved chronic heel pain. Radiographic findings in tuberculous osteomyelitis are non-specific, thus making it difficult to be differentiated from pyogenic osteomyelitis. The most common findings include osteopenia, subchondral sclerosis and soft tissue swelling.⁹ In their series of 44 patients, Mittal et al¹⁰ identified five types of lesions in tuberculosis of the foot based on its radiological pattern; cystic, rheumatoid, subperiosteal, kissing and spina ventosa. The 'cystic' type, as seen in our patient, is characterised by well-defined lucent lesion with no sequestrum (dead, sclerotic bone). 'Rheumatoid'-type lesion is similar to the changes seen in the coalesced carpals of patients with rheumatoid arthritis. 'Subperiosteal' type is scalloping or indentation of cortical bones.

'Subperiosteal' lesion involved in both articular surfaces in a joint results in the 'kissing'-type lesion. In children, tuberculous infection results in spindle-shaped expansion with layers of periosteal new bone denotes the 'spina ventosa'-type lesion. Identification of the radiological types may help in predicting prognosis of the infection. Patients with the cystic type do well with appropriate treatment, as is the case in our patient, whereas the rheumatoid type had the poorest outcome. Subtle changes in our patient's radiographs were missed initially; thus, MRI was performed to provide a more detailed imaging of the calcaneum to narrow the spectrum of differential diagnoses. Magnetic resonance (MR) images have been shown to be non-specific in the cases with infection.¹¹ In our patient, MR findings favoured a diagnosis of pyogenic osteomyelitis with increased marrow density, in contrast to tuberculosis, which typically presents with smooth margined lesion with normal marrow intensity. Diagnosis of pyogenic osteomyelitis of the calcaneum was made based on the clinical findings of tenderness over lateral aspect of the calcaneum, laboratory results of increased level of ESR and CRP and MR findings. To our surprise, the result of histopathological examination of bone tissue obtained during the surgical curettage of the calcaneum revealed granulomatous inflammation with areas of necrosis, which was highly suggestive of tuberculosis.⁴ Subsequently, her diagnosis was revised to calcaneal tuberculosis, based on the endemicity of the disease in our setting, clinical presentation and histological findings. She was started on a 2-months regime of ethambutol, isoniazid, rifampicin and pyrazinamide, followed by 7 months of isoniazid and rifampicin. Anti-TB is the mainstay of treatment for tuberculosis involving the foot, with a suggested minimum treatment duration of 9 months.¹⁰ It is important for the treating doctor to be aware that radiological features lag behind the healing progress; thus, the follow-up imaging is only recommended after 6 to 7 months after initiation of anti-TB.⁴ Surgical interventions have role in treating those who fail to respond to the anti-TB and to obtain a confirmatory tissue biopsy. Salvage surgical procedures, such as ankle and subtalar joint fusion, are also indicated in patients with painful deformities of the hind foot.⁴ In conclusion, unexplained 'benign' heel pain not responding to conservative measures could be a presenting symptom of calcaneal tuberculous osteomyelitis and warrants further investigation to avoid a delay in diagnosis.

How does this paper make a difference in general practice?

- It creates awareness regarding an uncommon cause of heel pain, which is a common presentation in primary setting.
- Value-added knowledge regarding diagnostic features and the treatment of calcaneal tuberculosis.

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Catamenial epilepsy: A missed cause of refractory seizure in young women

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Kandeepan J, Shaaban J. Catamenial epilepsy: A missed cause of refractory seizure in young women. *Malays Fam Physician*. 2016;11(2 & 3):24–26.

Keywords:

Catamenial epilepsy, menstrual cycle, oestrogen, progesterone

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Abstract

Catamenial epilepsy refers to changes in the frequency of seizures over the course of the menstrual cycle. A thorough history and detailed review of the patient's seizure diary are imperative to classify the seizures accurately and select the most appropriate antiepileptic treatment. As catamenial epilepsy rarely responds to antiepileptic medications, the physician should regularly revise the treatment plan of the women with epilepsy that is refractory to the current treatment. We describe the case of a 34-year-old single woman who presented with refractory seizures.

Introduction

Although epilepsy is a debilitating chronic condition, the correct choice of antiepileptic medication can successfully control up to 70% to 80% of the epileptic seizures.¹ Based on the involvement of the cerebral cortex, seizures can be divided into two major groups: focal and generalised. Many factors, such as sleep deprivation, emotional stress, photic stimulation and hormonal changes, can precipitate seizure attacks.² In catamenial epilepsy, the frequency of seizure exacerbation occurs in association with the menstrual cycle, with the seizures occurring when the ratio of oestrogen/progesterone levels in the bloodstream increases.^{2–4}

Ovarian hormones have many biological effects, including neuroactivity. Oestrogen decreases the seizure threshold, and progesterone raises it, supporting a hormonal influence on the seizure frequency in catamenial epilepsy.⁵ Wide variability in the prevalence of catamenial epilepsy has been reported, with one study reporting that it affected 10% to 70% of the fertile women with epilepsy. This wide variability may be due to the different criteria used to define seizure exacerbation associated with the menstrual cycle. These include patient's self reports, diaries and other inaccurate records of menses-related seizures.⁵ In the present case, the patient experienced a dramatic reduction in seizure occurrence following the alteration of her hormonal ratio.

Case summary

A 34-year-old Malay woman with epilepsy since her adolescent years presented to a primary

health clinic for a scheduled follow-up. The patient's initial brain computerised tomography scan and electroencephalography, in addition to routine investigations, were normal at the time of diagnosis. Her seizures were refractory despite being adherent to three antiepileptic medications at the maximum tolerable doses for a few years. She was on carbamazepine 400 mg twice daily, phenytoin 400 mg once daily and topiramate 100 mg twice daily.

Most of the seizures were generalised with occasional focal seizures. All seizure attacks were short duration, which lasted about 1 minute. The patient experienced clusters of seizure attacks during and in between her menstrual periods. She attained menarche at the age of 13 years, and her menstrual cycles were regular (every 28–29 days), with her menses lasting for 4 to 5 days. The patient was advised to mark the first day of her menstrual cycle in the seizure diary for the next three consecutive months.

At the following 3-month review, we noticed that the patient's seizure diary showed clusters of seizure attacks at two distinct times of each month. The first set of seizure attacks seemed to occur 2 days before the first day of menstruation until the last day of menstruation. The second episodes of seizures were clustered around the time of ovulation each month.

Initiation of hormonal treatment was discussed with the patient and her mother who was the sole provider of the patient. Initially, the mother was reluctant for her virgin daughter to start on hormonal treatment due to misperceptions about reversible contraception. After a detailed discussion, informed consent was obtained for

a trial of intramuscular medroxyprogesterone 150 mg, which was administered via 10 weekly injections. At the 10th week follow-up, the numbers of seizure attacks showed a marked decrease from 15–20 to 3–4 attacks per day.

Discussion

Catamenial epilepsy is defined as a periodical increase in seizure episodes during the menstrual period.³ Based on the timing of seizure exacerbation during the different phases of the menstrual cycle, catamenial epilepsy is classified as perimenstrual (ovulatory cycle), periovulatory (ovulatory cycle) or luteal (anovulatory cycle). Women with epilepsy whose seizure attacks are more frequent during one of these three phases should be diagnosed with catamenial epilepsy.⁶

In the present case, the seizures were refractory to treatment as it persisted despite three antiepileptic drugs administered at maximum tolerable dosages.⁷ When a seizure seems to be refractory to treatment, the physician need to evaluate many factors including whether the epilepsy was classified incorrectly or the patient was treated with an incorrect antiepileptic drug.⁸ A review of the patient's seizure diary revealed that the frequency of the seizures increased during the ovulatory and perimenstrual periods; hence, the possibility of catamenial seizures needs to be considered.

Studies have confirmed that catamenial seizures are usually not responsive to anti-epileptic drugs alone. To date, there is no specific drug treatment for catamenial epilepsy. However, non-hormonal and hormonal therapies have been proposed.^{3,4} Among the non-hormonal treatments, acetazolamide, a carbonic anhydrase inhibitor, showed some effectiveness against catamenial epilepsy, although its efficacy diminished over time, and tolerance developed.⁵ Similarly, treatment with clonazepam, an intermediate-acting benzodiazepine, led to a reduction in seizure frequency in catamenial epilepsy. However, long-term use of clonazepam can lead to dependency and tolerability.⁵

Among the hormonal treatment, several studies reported that a trial of either oral cyclical progesterone or intramuscular medroxyprogesterone injections resulted in a reduction and remission in seizures. When using the cyclical progesterone, high

oral progesterone doses of 600 mg/day can be given from day 16 to 25 of the menstrual cycle. It is a better treatment choice for patients with anovulatory luteal phase catamenial epilepsy.³ Zimmerman et al.⁹ reported that three doses of intramuscular Depo-Provera (medroxyprogesterone) two weekly at 250, 250 and 150 mg led to remission of seizures for 4 months. Thereafter, the seizures returned, but their frequency was markedly reduced.

In this patient, the seizures were associated with ovulation and peri-menstruation; intramuscular medroxyprogesterone injections were administered to keep the progesterone/oestrogen ratio high in the entire cycle. The injections were administered 10 weekly as she was also on an enzyme-inducing antiepileptic drug, carbamazepine which can affect the progesterone level.¹⁰

It was not an easy task to suggest contraception to an unmarried woman or to change the woman's perception of contraception as an antifertility drug. Najafi et al.¹¹ confirmed a similar misconception in a study of well-educated Malaysian women. In their study, all the interviewees had misconceptions about contraception and fertility. These misconceptions were based on their own experiences and those of their peers.¹¹ The present case was no exception. However, after a lengthy explanation, we were able to convince our patient and her mother about the value of taking the hormonal injection.

A key element of the family physician's role in chronic disease care is 'healing' the patient, as well as managing the disease.¹² Epilepsy management is not about eliminating risks, but helping individuals reduce these risks while living a normal life and carrying out daily activities. This case demonstrates that the physicians have to be more vigilant and should not hesitate to revise the diagnosis and re-evaluate the treatment plan when seizures are refractory to treatment. A prompt re-evaluation will reduce unnecessary suffering and improve the quality of life of the patient.

Diagnosing the type of seizure is challenging for most physicians, as they rarely witness their patient's seizure. Unfortunately, the patient cannot be a historian. Therefore, the detailed history from the eyewitness is imperative to diagnose the type of seizure. An accurate diagnosis is important because the type of

seizure influences the choice of medication.

Conclusion

Catamenial epilepsy is relatively common. A seizure diary is imperative in the management

of epilepsy, and the physician should re-evaluate patients when the seizures fail to respond to optimum treatment. In women with epilepsy, catamenial epilepsy should be considered in the diagnosis when the seizures are refractory.

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Choledochal cyst in pregnancy

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Koh KS, Bickle I, Mathew VV, et al. Choledochal cyst in pregnancy. *Malays Fam Physician*. 2016;11(2 & 3);27–29.

Keywords:

Biliary disorder, pregnancy, cystic disease, cholangitis, obstructive jaundice

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Abstract

Introduction: Biliary diseases during pregnancy are not uncommon and are frequently due to cholelithiasis. Choledochal cyst during pregnancy is rare. The management of biliary pathologies during pregnancy poses a challenge as the window of opportunity to carry out any interventions with minimal risk is small.

Case report: We report the case of a lady who was diagnosed with a large type I choledochal cyst during the second trimester of pregnancy. Due to increasing symptoms and recurrent cholangitis, she was managed with antibiotics and surgical resection. She remained well and delivered a healthy baby boy.

Conclusion: Clinicians need to consider choledochal cyst as a differential in pregnant patients presenting with upper abdominal fullness.

Introduction

Biliary disease during pregnancy is not uncommon and is frequently due to stone disease.¹ Although reported, choledochal cyst during pregnancy is rare.^{2–4} Given that radiological investigations are not frequently performed during pregnancy, diagnosis of choledochal cyst is often delayed. The management of biliary pathologies during pregnancy poses a challenge as the window of opportunity to carry out any interventions with minimal risk is small. It is limited to the second trimester when the risk of inducing miscarriage or causing premature labour is less.

Case summary

A lady, in her mid-twenties (G₁P₀), in the second trimester was referred from the peripheral clinic for the evaluation of intermittent abdominal discomfort for the past 4 weeks. This was associated with some nausea but no other abnormalities, such as fever or darkening of urine, were observed. Ultrasound scan (USS) at the peripheral clinic had

detected a large cystic lesion in the right upper quadrant area. The gravid uterus was normal. Prior to this, her antenatal care had been uneventful and her pregnancy had progressed satisfactorily. She denied having any abdominal symptoms prior to her pregnancy. There was no significant personal past medical or family history. On examination, she was well and comfortable with a gravid uterus appropriate for the gestational age and fullness in the right upper quadrant and epigastrium that was mildly tender on deep palpation.

A repeat USS in the hospital confirmed the presence of a large cystic mass and it was not possible to locate the gallbladder or assess the relation to other structures. Her liver profiles showed mild cholestasis (serum ALP 234 IU, GGT 250 IU and bilirubin 24 mmol/L). A magnetic resonance cholangiopancreatography showed a large cystic dilatation (9 × 11 cm) in the right upper abdomen of biliary origin (**Figure 1A and B**). Based on these findings, type I choledochal cyst was diagnosed.

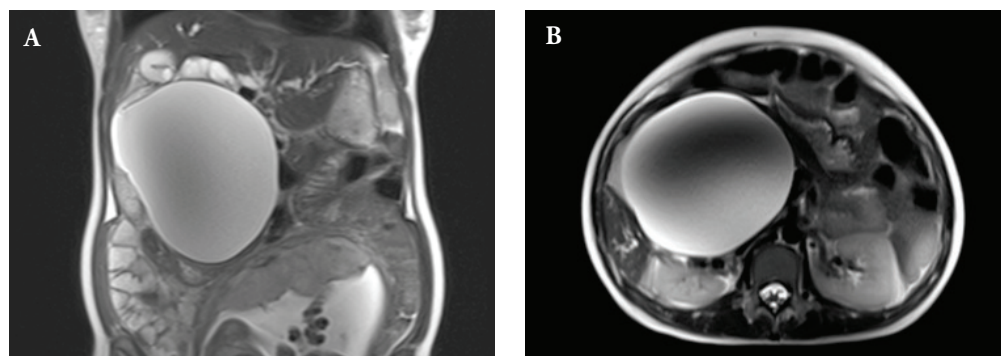


Figure 1. (A) MRI scan showing a large cystic structure in the upper right abdomen next to the gravid uterus, and (B) axial image showing the large round cystic mass; type I choledochal cyst

Management options that included endoscopic drainage (endoscopic retrograde cholangiopancreatography [ERCP] and stenting), percutaneous drainage and surgery were discussed. However, the patient's symptoms improved with medical treatment and the patient opted for conservative management. During the clinical review, the patient continued to have intermittent abdominal pain and fever. A repeat liver profiles showed worsening cholestasis with elevated bilirubin. An endoscopy (ERCP) with appropriate lead shielding was attempted, but failed due to the gravid uterus and large cyst displacing the duodenum. In view of the massive size of the cyst posing a risk to pregnancy (i.e. premature delivery, cyst rupture and also the risk of cholangitis) and after a detailed discussion with the patient and husband, it was decided to proceed with surgical resection of the cyst. She underwent surgical excision of the choledochal cyst, cholecystectomy and formation of a Roux-en-Y hepaticojejunostomy without immediate complication to the patient or pregnancy. The resected specimen showed an inflamed biliary tree but no evidence of cholangiocarcinoma. Postsurgery, her pregnancy progressed without any problem and she had a normal uncomplicated delivery of a healthy baby boy. The patient remained well in the following 2 years follow-up and went back to her country of origin.

Discussion

Choledochal cyst is a rare congenital dilatation of the biliary system and is classified into four types: type I—fusiform dilatation of the common bile duct; type II—a diverticulum of the extrahepatic duct; type III—cystic dilation of the intraduodenal portion of the bile duct; and types IV, type IVa—intrahepatic cystic dilations and IVb—affecting the extra and intrahepatic ducts.⁵

The exact pathogenesis of this condition is unknown. However, it is widely believed that the presence of a long common channel with an abnormal pancreaticobiliary junction results in the chronic reflux of pancreatic enzymes into the biliary tree. This results in the damage and progressive dilatation of the biliary tree.⁵ However, this does not explain the various manifestations and the pathogenesis remains debated.

Choledochal cyst presenting during pregnancy is rare.^{2-4,6,7} Unsuspected, the diagnosis will

be delayed and this can lead to pancreatitis, ascending cholangitis, biliary cirrhosis and even cyst rupture with resultant dire foetal and maternal outcomes.^{2-4,6-9} During pregnancy, the radiological imaging is often limited to USS and magnetic resonance imaging (MRI). USS features of choledochal cysts depend on the stage of the disease. Early cyst formation may resemble a dilated common ductal system as in biliary obstruction. However, as in most of the cases that present with symptoms like our case, the cystic dilations are typically large. In some cases, continuity with the biliary system can be appreciated. However in large choledochal cysts, the appreciation of communication with the biliary tree may not be possible due to the mass compressive effects. However, any cystic dilatation in the epigastric or right upper quadrant in the location of the biliary system should heighten the suspicion of a choledochal cyst.¹⁰ MRI is the preferred imaging modality when the diagnosis is in doubt as it is able to better demonstrate the anatomy of the biliary tree and its relations with the choledochal cyst. However, MRI is not widely available.

The management of choledochal cyst in pregnancy is challenging as there are risks to mother and foetus.³ Given that the treatment period window is limited, an important aspect of the management is early recognition and diagnosis so that the management can be planned. Generally once diagnosed, a conservative approach is usually adopted as far as possible, and if the symptoms become progressive or cyst-related complications arise, other options need to be considered. Endoscopic intervention is the primary option to consider and radiation exposure should be minimised by limiting fluoroscopy time and the use of lead shielding. Endoscopic ultrasound guidance that avoids radiation exposure is another good and preferred option.¹¹ Percutaneous drainage of the choledochal cyst has been reported to be a useful alternative.⁷ Surgery is usually avoided in the first trimester unless the symptoms become life threatening. Ideally, surgery should be performed in the second trimester when the surgical and anaesthetic risks are at the lowest. Due to the possibility of cyst rupture from high intra-abdominal pressure during labour, an elective caesarean section is generally recommended when the foetus is sufficiently matured and definitive surgical excision of the cyst should be planned given the increased risk of biliary tract carcinoma in choledochal cysts.

In conclusion, choledochal cyst in pregnancy is rarely encountered. Delay in appropriate management may lead to complications in both the mother and developing foetus. A conservative management may be appropriate during pregnancy; however, due to the increased risk carcinoma, excision of the cyst should be considered after pregnancy.

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Congenital cholesteatoma: Different clinical presentation in two cases

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Abdul Jalil S, Md Daud MK. Congenital cholesteatoma: Different clinical presentation in two cases. *Malays Fam Physician*. 2016;11(2 & 3):30–32.

Keywords:

Cholesteatoma, middle ear, congenital

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Abstract

Introduction: Congenital cholesteatoma (CC) of the middle ear is a rare entity that may be undiagnosed for years. The lesion can grow undetected until it produces symptoms such as reduced hearing or otalgia.

Method: Case report

Results: We report two cases of young ladies with CC who presented with different otological symptoms. The first case complained of recurrent unilateral ear pain while the second case presented with unilateral reduced hearing. Examination of both cases revealed a whitish mass seen behind an intact tympanic membrane. Both cases underwent surgery and histopathological examinations; findings were consistent with cholesteatoma.

Conclusion: There are varieties of clinical presentations of CC and the diagnosis is based on clinical findings.

Introduction

Congenital cholesteatomas (CCs), though uncommon, have been well documented and described in the literature. Congenital middle ear cholesteatoma is defined as a keratinising epithelial rest that occurs behind an intact tympanic membrane without a prior history of infection or trauma. Although its cause is unknown, several theories have been proposed to explain its origin. The theories include the induction of keratinising epithelium from the middle ear mucosa due to inflammation, squamous metaplasia and the 'migration' of epithelial debris into the middle ear through the eustachian tube.¹ We report two cases of CC with different presentations.

Case report

The first case is an 18-year-old lady who presented with a complaint of on and off right ear pain for 1-year duration. She denied any history of hearing loss but her family claimed otherwise. There was no history of vertigo, tinnitus or headache.

The examinations of the right ear revealed a whitish soft tissue mass behind an intact tympanic membrane at the anterosuperior quadrant (**Figure 1**), and the other ear showed no abnormality. Rinne test was negative on the affected side while Weber was lateralised towards the side. Pure tone audiometry showed

mild conductive hearing loss of the right ear. Computed tomography (CT) scan of the temporal bone revealed a soft tissue density within the epitympanic recess extending into Prussak's space and mastoid air cells through the aditus and antrum. Atticotomy was done. Intraoperatively, a whitish mass was found in the attic but limited to the epitympanum space. The handle of malleus and incus were eroded. The mass was removed. The atticotomy area was covered with a tragal cartilage.

The second case was a 13-year-old girl who presented with progressive left ear reduced hearing for 1-year duration associated with ear discomfort and tinnitus. There was no history of vertigo, tinnitus or headache. The examination of the left ear revealed a bulging tympanic membrane with a whitish mass seen behind an intact tympanic membrane (**Figure 2**) while the contra lateral ear was normal. Rinne test was negative on the affected side with Weber lateralised towards the ear. Pure tone audiometry showed severe conductive hearing loss of the diseased ear. CT scan showed a soft tissue mass within the epitympanum extending into mastoid air cells with widening of the antrum. The ossicles were displaced laterally and the lateral semi-circular canal was eroded. Modified radical mastoidectomy with type 3 tympanoplasty was done.



Figure 1. Otoscopic view of the right ear of the first case showing whitish mass behind an intact tympanic membrane



Figure 2. Otoscopic view of the left ear of the second case showing whitish mass behind an intact tympanic membrane

Discussion

CC is a relatively uncommon disease. It is diagnosed based on a finding of a white mass medial to a normal tympanic membrane with no prior history of otorrhea or tympanic membrane perforation or prior otologic procedures. The tympanic membrane can be visualised clearly by using a bright otoscope. The pinna is retracted backwards and upwards to straighten out the canal, allowing a more direct vision to the tympanic membrane. The pathogenesis of CC remains an area of controversy but it is thought to originate from rests of epidermoid cells incorporated into the temporal bone during embryonic development.

Though most of these patients complain of hearing loss, some are unaware of the condition until they are told that they have an abnormal tympanic membrane. Analysis by Kojima et al² in their study concluded 60.3% of their patients presented with hearing loss as a main complaint while 17.5% of the patients were initially

examined for otorrhea/otalgia. According to Tagaki,³ more than half of the patients with early-stage CC were diagnosed asymptotically by a chance visit to a clinic while hearing loss is the main complaint in advanced stages. The patient in our case who complained of hearing loss was having a more advanced disease. However, the patient who presented with otalgia was actually having recurrent otitis externa but was noted to have CC as well.

It is known that CC undergoes progressive expansion and commonly presents at later age. Both of our patients are teenagers. Kojima² reported that the mean age at presentation for CC was 13.3 years. Over time, it grows with possible extension and erosion to the remainder of the tympanic cavity, antrum and mastoid. The complications of cholesteatoma include hearing loss and intracranial abscess.^{4,5} The diagnosis of CC is usually made by clinical and otoscopic examination. CT scan of the temporal bone is performed to assess its extension, exploring for complications and detecting anatomic variants as preparation for surgery.

Treatment for CC remains surgical. The main objective is to eradicate the disease to restore a healthy aerated ear. Of no lesser importance, the second objective is to restore or improve the ossicular chain. The prognosis depends on its location, the age of the patient, degree of ossicular involvement and number of involved sites.

Conclusions

CC has a variety of clinical presentations. Hearing loss was the common presenting symptom but it can be diagnosed by chance at the early stage. The finding of a white mass medial to a normal tympanic membrane needs referral to an otorhinolaryngologist for early intervention and this can therefore avoid further complications.

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Leech in the Nose – an unusual cause of epistaxis

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Zainuddin N, Nair P, Razali F. Leech in the Nose – an unusual cause of epistaxis. *Malays Fam Physician*. 2016;11(2 & 3):33–34.

Keywords:

Leech, nose, epistaxis

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Abstract

Leech is an uncommon nasal foreign body, which can cause epistaxis. It is an aquatic segmental worm living in fresh water most commonly in tropical areas. Once it is attached in the nose, it will secrete an anticoagulant enzyme named hirudin, and that will result in continuous bleeding more than from a normal wound even after it is removed. We present a case of a live leech in the nose that caused unilateral epistaxis in a patient with a recent history of jungle trekking.

Introduction

Epistaxis is a common symptom. It is usually divided into bilateral and unilateral epistaxis. Unilateral epistaxis is commonly caused by tumour or foreign bodies, either animate or inanimate. Maggots are the most common animate nasal foreign body encountered, especially amongst debilitated patients. However, leeches as a cause of unilateral epistaxis are uncommon. Leech as a nasal foreign body has been reported in a limited number of articles.¹ History taking plays an important role in alerting the physician to the diagnosis, for instance, history of jungle trekking and swimming in ponds.

Case report

A 57-year-old male presented with epistaxis from the left nose for 1 week. The bleeding was minimal and stopped spontaneously. There were no nasal obstruction and sensation of foreign body moving inside the nose. Patient recently went for jungle trekking with his friends. There were no other relevant symptoms.



Figure 1. Nasoendoscopic examination showed moving leech at the left inferior turbinate

Nasoendoscopic examination was done and showed the presence of a leech in the left nasal cavity at the inferior turbinate (**Figure 1**). The leech was moving and removal was conducted using suction. There was no difficulty during removal, except for minimal bleeding which stopped with digital pressure applied over the nose. No other abnormalities were found in the nasal cavity.

Discussion

Leeches are annelids or segmented worms. Common species of leeches that can infest humans includes *Hirudinea granulosa* and *Hirudinea viridis*.² During the process of sucking blood, the leech secretes an anticoagulant that is responsible for continuous bleeding from the bite site.³ Leech forms an important differential diagnosis for nasal bleeding because it can travel down to lower airway and causes serious complications.

In our case, the leech was not noticeable to the private general practitioner because it could not be seen by anterior rhinoscopy. A live leech can move around in the nasal cavity and settle in the hidden areas that are difficult to visualise even with endoscopy, and hence can be missed on examination. So examination may not always reveal its presence in the nasal cavity.

A nasal leech has been reported to cause severe anaemia requiring blood transfusion in a child.⁴ A case of leech in the hypopharynx that caused unexplained bleeding from the throat has also been reported. In this case, the leech was visualised on the aryepiglottic fold only on repeated indirect laryngoscopy.⁵ Leech infestation can sometimes be difficult to diagnose especially when it is not visible on examination.

Leech in the nose can be removed in the clinic. Leech respiration takes place through its body wall. Anaesthetic agents such as lidocaine spray can be used to paralyse it and cause suffocation.⁶ As a consequence, it will move to the surface and its attachment to the mucosa become weakened. Then the leech can be removed easily.⁶

Conclusion

Leech infestation should be considered as one of the differential diagnoses in cases of unresolving epistaxis, especially when the history is suggestive of possible leech infestation such as recent jungle trekking. Endoscopic examination should be done to exclude the possibility of a leech in the nose.

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Glottic cancer in a non-smoking patient with laryngopharyngeal reflux

Zainuddin N, Mohd Kornain NK

Zainuddin N, Mohd Kornain NK. Glottic cancer in a non-smoking patient with laryngopharyngeal reflux. *Malays Fam Physician*. 2016;11(2 & 3):35–37.

Keywords:

Glottic carcinoma, non-smoker, laryngopharyngeal reflux

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Abstract

The onset of carcinoma of the larynx, especially of the glottis, is heralded mainly by a change of voice. It has a male preponderance and is almost exclusively common to smokers and patients with heavy alcohol consumption. We report a case of glottic carcinoma in a non-smoker female patient. The only possible risk factor for her is a history of laryngopharyngeal reflux.

Introduction

The incidence of laryngeal squamous cell carcinoma is low, comprising 1% of all the carcinomas in men, and much lesser in women.¹ In Malaysia, the most common type of laryngeal cancer is transglottic cancer. This is an extension of glottic carcinomas, which has extended to the adjacent areas. In comparison with the worldwide prevalence, the most common type of laryngeal cancer is glottic cancer. This signifies late presentation or detection of glottic carcinomas in Malaysia.² Early laryngeal cancers, especially those affecting the glottic subsite, are associated with a 5-year survival rate of >90%.³ It is more common in chronic smokers and alcoholics. Gastric reflux is believed to be a risk factor for the development of laryngeal carcinoma, although the literature is conflicting. It has been thought that laryngopharyngeal reflux can damage laryngeal epithelium through chronic inflammation, production of reactive oxygen and nitrogen species, intracellular acidification and activation of proliferative signalling pathways, all of which will finally lead to malignant transformation.⁴

Case report

A 67-year-old lady presented with hoarseness for 2 years, which is not progressive, and preceded by a history of prolonged cough. The symptom was associated with frequent throat clearing. She had no dysphagia, odynophagia, difficulty in breathing or aspiration symptoms. She was initially sought treatment from a private clinic and was subsequently referred to hospital. She initially treated by an ear, nose and throat surgeon (ENT) in another hospital

as laryngopharyngeal reflux for her prolonged cough and throat symptoms and was given follow-up to monitor the symptoms. She was referred to a general surgeon because she also complained of dyspepsia and heartburn. Esophagogastroduodenoscopy was done and she was diagnosed to have a peptic ulcer. However, she defaulted follow-up in the hospital and came to the private clinic again alternating with the government health clinic for follow-up for almost a year before she defaulted. She was referred to us by a cardiologist for persistent hoarseness when she came for her heart problem. She had mild difficulty in breathing; however, she did not have cough. She did not smoke or drink alcohol. She was not working and stayed with her daughter. There was no history of malignancies in the family.

On examination of the larynx, she had a swollen left true and false vocal cord with irregular border. There were phonation gaps, and the airway was slightly narrowed. She had no enlarged lymph node.

Biopsy of the swollen vocal cord and tracheostomy under general anaesthesia were done. Histopathological examination of the biopsy showed a few small clusters of malignant cells seen infiltrating the stroma. In other areas, atypical were seen admixed with fibrin and connective tissue. The cells were large with pleomorphic and hyperchromatic nuclei with eosinophilic cytoplasm. Some showed individual cell keratinisation. Abnormal mitoses were frequently seen. The diagnosis was squamous cell carcinoma (**Figure 1**).

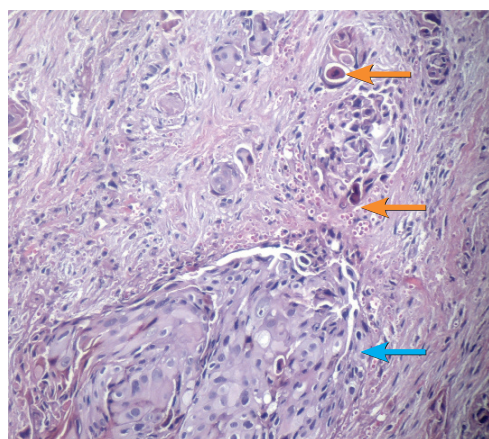


Figure 1. H&E stain $\times 20$: Tiny fragment of the tissue with areas of haemorrhage, focally infiltrated by solid sheets (blue arrow) and small clusters of malignant squamous cells. The cells are large and some have abundance eosinophilic cytoplasm with hyperchromatic nuclei. Individual cell keratinisation (yellow arrow) noted focally

She went for a computed tomography scan to determine the extent of the lesion and staging. There was a lesion over the left vocal cord extending to the anterior commissure, posterior commissure and strap muscle, especially the sternohyoid muscle. The thyroid cartilage was eroded. There was no distant metastasis seen. She was staged as $T_{1b}N_0M_0$. She was treated with radiotherapy. Currently, she was still under follow-up after oncology therapy without evidence of recurrence.

Discussion

Smoking and alcohol consumption are the main risk factors for laryngeal cancer.⁴ It is less common in non-smokers, as in our patient. She also did not drink alcohol. Other minor risk factors that have also been associated with laryngeal cancer are diet,⁵ environmental and occupational exposures,⁶ dentition and oral hygiene⁷ and gastroesophageal reflux.⁸ The only positive risk factor was acid reflux.

Reflux of gastric acid has been primarily and commonly associated with oesophageal adenocarcinoma, usually due to metaplastic transformation.⁹ Acid reflux can reach beyond the oesophagus into the laryngopharynx (known as laryngopharyngeal reflux). However, such transformation is not common in the pharynx and larynx.

A recent case-controlled study reported significant positive association between a history of frequent acid reflux and incidence of laryngeal squamous cell carcinoma among non-smokers and non-drinkers. They also reported an inverse association between antacid use and laryngeal squamous cell carcinoma, suggesting the efficacy of the treatment in reducing the risk of laryngeal carcinoma attributable to gastric reflux.⁴ Their finding is consistent with several published studies^{10–12} on the relationship between gastric reflux and laryngeal cancer. Our patient was not compliant towards her treatment for gastric ulcer, and this probably predisposed her to the development of cancer.

The most common symptom for glottic carcinoma is hoarseness followed by stridor.² A cross-sectional survey was done in 2010 looking at the reasons and timing of referral for patients with hoarseness, for instance persistent symptoms >2 weeks, worsening of symptoms, associated symptoms, e.g., cough, dysphagia, shortness of breath and neurologic symptoms, risk factors like alcohol and tobacco users and if the patient is a professional voice user. The most common reasons given by primary care physicians for not evaluating patients with voice problems include patient not complaining of voice problem, unsure of the best method, more important problems, not comfortable evaluating patient's voice, not enough time, and unsure of treatment options. Less common reasons are the primary care physicians do not feel the voice problem is a priority and no ENT or speech pathologists.¹³ In our case, the reason for the delay in the diagnosis could be due to her non-progressive symptoms. She had been having the symptoms with similar severity for 2 years, and non-compliance was thought to be the reason as to why the patient was having having persistent symptoms. The fact that glottic cancer does not commonly present with cervical lymph node enlargement will make the clinical suspicious of malignancy more difficult. Most of the head and neck cancers usually cause progressive symptoms but not in this patient. The only way to confirm the diagnosis of malignancy is by histopathological examination. It is safer to have a high index of suspicion for malignancy in elderly patient even though the history is not suggestive.

Conclusion

Laryngopharyngeal reflux has been described as one of the minor risk factors for the development of laryngeal squamous cell carcinoma. It should be considered as a possible risk factor especially in a patient who is not

smoking and consuming alcohol. Suspicious of carcinoma should be higher especially in the elderly, to avoid misdiagnosis and continuously treating for acid reflux. Biopsy should be performed to get histopathological diagnosis to exclude malignancy.

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Head and neck tuberculosis: The great mimic

Mohamad I, Nik Hassan NFH, Nik Othman NA

Mohamad I, Nik Hassan NFH, Nik Othman NA. Head and neck tuberculosis: The great mimicry. *Malays Fam Physician*. 2016;11(2 & 3);38.

Keywords:

Tuberculosis; Otolaryngology;
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Dear Editor,

We read the article published in the past issue of MFP entitled 'Primary tuberculosis of the hard palate' with great interest.¹ Indeed, it is a common pathology occurring at a rare site. In the reported case, the sign of having palatal mass was not provisionally suspected as tuberculosis (TB), leading to investigation along the line of a malignant lesion, which included MRI. We have encountered a number of extrapulmonary TB cases manifested as lesions along the upper aerodigestive tract, with negative findings on chest evaluation. Extrapulmonary TB is more frequently encountered nowadays.

In the head and neck region, the presenting symptoms of TB might be the same with other pathologies. Mimicry of other diseases causing delayed diagnosis is common. For example, TB of the middle ear presents as a chronic, painless ear discharge – one of the most common otological complaints. This symptom sometimes does not bother the patient enough to seek early treatment until new sequelae or complications, such as vertigo or facial asymmetry develops.² TB otitis should be suspected in a chronic discharging ear that fails to respond to the usual anti-bacterial therapy. A high level of clinical suspicion is needed for early diagnosis and commencement of anti-tubercular treatment.

Likewise in laryngeal TB, the presenting symptoms are voice changes, sore throat with or without haemoptysis, dysphagia and odynophagia.³ The symptoms mimic laryngeal reflux disease, chronic pharyngitis or even carcinoma of the larynx. The diagnosis can be confirmed only with a tissue diagnosis taken for biopsy. With an index of suspicion, the additional request for mycobacterial culture will help to consolidate the diagnosis of TB.

Among the common differential diagnoses of a painless growing neck mass, especially in an adult male, is a cold abscess or scrofula.⁴ This term refers to TB of the cervical neck lymph nodes. It is more common in immunocompromised patients; especially in users of illicit intravenous drugs.⁵ Clinical suspicion is important, leading to prompt accurate investigation and treatment.

Direct communications between the lungs and other parts of head and neck regions, namely the oral cavity, pharynx and larynx, have been reported in the literature. In a clinically suspected case, screening starts from history. Important predisposing factors include a previous history of TB, contact with TB patients, lack of vaccination with Bacillus Calmette–Guérin or living in a community where herd immunity is suspected to be breached (vaccine-hesitant community⁶). After the screening workup and confirmatory investigations, the commencement of anti-tuberculous treatment is quite standard and straightforward. The paramount importance in the management of these head and neck TB is the awareness of its existence among the primary health care workers, leading to high clinical suspicion of the disease.

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Rash in a foreign worker

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Nurjahan MI, Tevaraj P. Rash in a foreign worker. *Malays Fam Physician*. 2016;11(2 & 3):39–41.

Keywords:

Pruritis, skin rash, creeping, plantation, Malaysia

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Abstract

Hookworm-related cutaneous larva migrans (HrCLM) is a zoonosis which is endemic in many sub-tropical and tropical countries including Malaysia. We report a case of a 40-year old plantation worker who presented with a pruritic rash on his abdomen. It is important for clinicians to diagnose and treat HrCLM promptly as this condition results in considerable morbidity when treatment is delayed.

Case Summary

A 40-year-old male foreign worker employed in a palm oil plantation presented with itchy rashes over his abdomen, which was spreading daily over the past 1 month. The skin lesions were intensely pruritic; however, there was no discharge or pain. He did not have any history of fever, insect bite or exposure to chemicals. He did not rear any pets. He does not remember being bitten or having pain before the onset of the rashes.

His job is to harvest the palm oil fruits, cleaning and carrying palm leaves that have fallen on the soil. Sometimes, he sleeps under the tree on the ground during his lunch break. He does not wear a shirt while working because he sweats a lot. None of his co-workers had similar rashes. He had no past history of atopy, rhinitis, asthma or other medical illnesses. He was treated by a doctor in a different clinic 2 weeks earlier with an antifungal cream and oral antihistamine with no improvement.

On examination, the patient was well built and of short stature. He was comfortable and afebrile. Erythematous, serpiginous and raised lesions with scattered papules in a curvilinear pattern were noted over his abdomen. There were some excoriations over the skin with blistering (**Figure 1**). He did not have any rashes over his legs or groin. He did not have any lymphadenopathy. There were no other significant findings.



Figure 1. Curvilinear, raised and erythematous lesions over the abdomen

Questions

1. What is your provisional diagnosis?
2. What is the aetiology and pathogenesis?
3. What are your differential diagnoses?
4. What complications may occur in this condition?
5. What are the treatment options in this condition?
6. What preventive measures are effective in this condition?

Answers

1. The provisional diagnosis is hookworm-related cutaneous larva migrans (HrCLM).

The diagnosis of HrCLM is made clinically on the basis of a typical clinical presentation. There is usually a history of the patient walking barefooted on the beach; working or lying on contaminated soil without proper attire; and carrying plants, leaves and soil close to the body. The patient later develops pruritic, serpiginous, erythematous cutaneous eruption rashes that keep advancing. This creeping eruption as a clinical sign is diagnostic; laboratory investigations or biopsy is not useful.^{1,2,4} In this patient, carrying of palm tree leaves contaminated with soil containing cat hookworm and lying on the ground could have contributed to the infection being located on the abdomen.

2. HrCLM is a parasitic skin disease caused by accidental percutaneous penetration and

subsequent migration of animal hookworm larvae in the epidermis. It is most commonly caused by the hookworm that infects dogs and cats. The parasite's eggs are passed from animal faeces into warm, moist soil where the larvae hatch. Transmission occurs when the skin comes in direct contact with contaminated soil; while walking barefooted, sitting or lying on it, and when manual workers work on contaminated soil without proper attire.

In humans, the larvae are unable to penetrate the basement membrane to invade the dermis, so the disease remains limited to the epidermis. The larva, confined to the epidermis, migrates aimlessly; advancing about 3 cm per day forming, winding, serpigenous, tracts, which are erythematous, raised about 2–3 mm in width and 5–7 mm in length. The tracts may contain serous fluid and small blisters caused by immune response to the secretions of the larva.

The larva is normally about 2 cm beyond the lesion. However, it is important to note that the location of the track does not necessarily relate to the location of the larva, which may move randomly ahead of the track. Penetration of the larva can cause tingling or prickling of the skin at that site and eruption within 30 minutes. Larvae can remain dormant for some months but migration can sometimes begin immediately. The incubation period can vary from 15 to 165 days.

The frequently affected areas are feet, buttocks and abdomen. Genitals and hands can be affected in children.

The common species causing cutaneous larva migrans are as follows:

- a. *Ancylostoma braziliense* that infests dogs and cats
- b. *Ancylostoma caninum* that infests dogs
- c. *Uncinaria stenocephala* that infests dogs
- d. *Bunostomum phlebotomum* that infests cattle
- e. Occasionally, human hookworms such as *Necator americanus* and *Ancylostoma duodenale* have been found to cause larva migrans

3. The differential diagnoses are as follows:

- a. Scabies
- b. Erythema chronicum migrans
- c. Phytophotodermatitis

Less commonly, creeping skin eruption may be due to:

- d. Larva currens caused by *strongyloides stercoralis*, which spreads at the rate of 5 cm per hour and the tracts are less haphazard and confined to the buttocks and trunk
- e. Gnathostomiasis, cutaneous paragonimiasis and fascioliasis; the latter is caused by liver fluke

4. Complications of cutaneous larva migrans are as follows:

- a. Secondary bacterial infection
- b. Allergic reaction
- c. Loeffler syndrome

5. Treatment options for cutaneous larva migrans are as follows:

- a. Ivermectin is the drug of choice in a single dose of 12 mg (200 µg per kg bodyweight). It is well tolerated and highly effective but contraindicated in children less than 5 years.
- b. Topical thiabendazole 15% cream for 5 days in children weighing less than 15 kg where ivermectin cannot be used; although less effective, it is a good alternative for young children to avoid the potential side effects of systemic medications.
- c. Oral Albendazole 400mg twice daily for 3–7 days is usually well tolerated.
- d. Freezing the tip of the lesion has been tried but is not effective because the tip of the serpiginous track does not indicate the actual site of the moving larva.
- e. Ethyl chloride spray has been tried but was found to be ineffective.
- f. Cryotherapy with liquid nitrogen has also been tried but was found to be ineffective as well as caused ulcerations and blisters.

6. Prevention

- a. Most effective steps are the use of appropriate footwear; closed shoes must be worn while walking outdoors and on beaches.
- b. Refrain from sitting or lying down on soil or sand.
- c. Cats or dogs should
 - i. be regularly dewormed.
 - ii. not be allowed in the bathroom and on the beaches.
 - iii. be prevented from defecating in public areas like parks and playgrounds; animal waste must be appropriately and immediately cleaned up.

Practice points

1. This condition is often missed in primary care.^{1,2,5,6}
2. Even though this condition is self limiting, the intense pruritus and risk of infection mandate the treatment.^{3,4}
3. Bacterial infections secondary to scratching can complicate the condition and should be treated with appropriate antibiotics.⁷
4. Primary healthcare practitioners need to be well informed about this condition as it is easily treatable.^{8,9}

Conflict of interest

None

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