

Exploring consumers' perceptions and knowledge of acetaminophen (paracetamol): a cross-sectional study from Penang, Malaysia

*Chee Ping Chong

B. Pharm (Hons), MCLinPharm, PhD
Discipline of Clinical Pharmacy, School of Pharmaceutical Sciences,
Universiti Sains Malaysia (USM), 11800 Minden, Penang, Malaysia
TeL: +6 012 534 2685; Fax: +6 04 657 0017;
Email: jjueping@gmail.com

Seak Fang Tan

B.Pharm (Hons), MSc (Clin Pharm)
Discipline of Clinical Pharmacy, School of Pharmaceutical Sciences,
Universiti Sains Malaysia (USM), 11800 Minden, Penang, Malaysia.

Weng-Tink Chooi

B.Sc (Eng.), M.A.(Exp Psychol), PhD (Exp Psychol)
Advanced Medical & Dental Institute, Universiti Sains Malaysia (USM), Bertam
13200 Kepala Batas, Penang, Malaysia

ABSTRACT

Purpose: Acetaminophen poisoning is a common problem in Malaysia. This study aimed to evaluate the perceptions and knowledge of acetaminophen among the consumers in the state of Penang, Malaysia. The study findings would help in the development of strategies to address the issue of acetaminophen poisoning. **Method:** This was a survey involved a convenient sample of 400 consumers who visited Health Clinic of Universiti Sains Malaysia (USM), Out-patient Clinic of Advance Medical and Dental Institute, USM and five selected community pharmacies. **Results:** Majority of the consumers perceived acetaminophen as safe to use (69.1 %) and very effective for minor and moderate pain (81.8 %). Approximately 52% of the consumers agreed that the reduction of maximum pack size of acetaminophen will decrease the risk of over-consumption and poisoning rate while 73.8 % agreed that better product labelling can help to decrease the misuse of acetaminophen. Most of the consumers (82.5 %) did not know the content of acetaminophen. Around 86 % of the consumers knew the proper recommended dose of acetaminophen 500 mg tablet per intake in adults while 50.0% knew the correct frequency of intake. Only 46.0% of the consumers were alert about interaction between acetaminophen and alcohol. Less than half of the consumers knew that acetaminophen overdose can cause liver injury (26.8 %) and may cause fetal death and spontaneous abortion during pregnancy (19.5 %). **Conclusion:** Knowledge deficits regarding acetaminophen were found among the consumers and prompt educational intervention is needed to address this issue.

Keywords - Acetaminophen, paracetamol, consumer, perception, knowledge

I. INTRODUCTION

In the recent years, self-medication using over-the-counter (OTC) medicinal products has become a global norm among the consumers [1, 2]. Acetaminophen (paracetamol) is one of the most commonly used OTC analgesic drugs among the consumers for self-medication of minor ailments such as fever and common pain [3, 4]. Self-medication is defined as the consumption of a medicinal product for the treatment or prevention of a disease or for the promotion of health without a professional prescription or advice of a healthcare provider [5, 6]. Economical factors and previous experience prior to use of these OTC drugs have contributed to the self-medication practices among the consumers [6, 7].

The major concerns regarding self-medication are the risk of inappropriate use of OTC drugs and the occurrence of toxicity related to its used [6]. Acetaminophen poisoning is a common problem in Malaysia and it involved consumers from different age groups [8]. Indeed, acetaminophen is the most commonly reported drugs involved in accidental or intentional poisoning around the globe [8-10] and in some of the cases, severe liver toxicity and death were reported [11, 12]. The poisoning requires emergency hospital treatment and this leads to a significant burden on healthcare expenses [13].

A previous study from the United States revealed that the lack of knowledge about acetaminophen is one of the risk factors for the misuse of acetaminophen [14]. However, currently little is known about the Malaysian consumers' perception and knowledge of acetaminophen. There is a strong need to assess the consumers' attitude and understanding about acetaminophen as this would help in the development of strategies to address the issue of acetaminophen misuse in Malaysia. Therefore, this study was aimed to evaluate the perceptions and knowledge of acetaminophen among the consumers in the state of Penang, Malaysia.

II. MATERIALS AND METHODS

This was a survey involved a convenient sample of 400 consumers who visited Health Clinic of Universiti Sains Malaysia (USM) (n = 103), Out-patient Clinic of Advance Medical and Dental Institute, USM (n = 145) and five selected community pharmacies (n = 152) in state of Penang. The sample size was calculated by using the Raosoft® Software. A sample size of 400 consumers would be able to generate results with 5 % margin of error and 95 % confidence interval. The study was conducted in different location in order to recruit the consumers from different demographic background. The consumers from the USM settings consist of university students and staffs. The consumers from the community pharmacies would consist of general public. The inclusion criteria were consumers above the age of 13 years old and literate in either Malay, English or Chinese language. Healthcare practitioners and students from any medical or health field were excluded from the study.

This study involved a questionnaire which was developed based on a literature review. The initial questionnaire was developed in English language and was assessed for face and content validity by two experts who were academicians in the School of Pharmaceutical Sciences, USM. The questionnaire was assessed on whether the questions were relevant for the respondents to answer (face validity) and whether the content are adequate to answer the objectives of the study (content validity). Subsequently, a forward and backward translation was performed to translate the questionnaire into Malay and Chinese language. The questionnaire was further adjusted after pilot testing with five randomly selected consumers in state of Penang. The questionnaire was then assessed for reliability with Cronbach alpha value by using a total of 30 consumers in the state of Penang. The Cronbach alpha value for the questions which assessed the consumers' perception and knowledge of acetaminophen were 0.709 and 0.738 respectively

The final version of questionnaire was sent by personal visit by the principle investigator (Tan Seak Fang) to the study site. The survey was conducted from 1st February 2013 to 30th April 2013. All data collected were entered into IBM SPSS® Statistics version 23 for analysis and descriptive statistic was used. This study was granted ethics approval from the Universiti Sains Malaysia-Hospital Lam Wah Ee Ethics Committee (ethics approval number: USM-HLWE/IEC/2012(0017)).

III. RESULTS AND DISCUSSION

The consumers were mostly female (57.5%) and aged between 14-25 years (43.8%). The rest of the consumers were aged between 26-40 years (33.0%) and more than 40 years (23.2%) respectively. Regarding ethnicity, 47.8% of the respondents were Malay while 45.3% were Chinese and 5.0% were Indian.

Majority of the consumers perceived acetaminophen as safe to use (69.1 %) and very effective for minor and moderate pain (81.8 %). The consumers mostly agreed that acetaminophen is cheap in price (58.5 %) and very convenient to purchase (90.8 %). Most of them will recommend acetaminophen to family or friends (56.6 %) and kept it in house (79.5 %). Majority (75.1 %) of the consumers viewed that there are too many choices of originator and generic brand acetaminophen products available in the market. Around 52% of the consumers agreed that the reduction of maximum pack size of acetaminophen will decrease the risk of over-consumption and poisoning rate. Additionally, 73.8 % of the consumers agreed that better product labelling can help to decrease the misuse of acetaminophen. More than half of the consumers indicated that advertisement can greatly influenced their decision to purchase acetaminophen (63.8 %) and the sale of acetaminophen should be controlled (58.8 %) (Table 1).

Majority of the consumers understood that acetaminophen is indicated for headache (89.5 %) and fever (86.5 %). A few consumers (< 3%) misunderstood that acetaminophen can be used to treat vomiting, cough, fit or seizure and constipation. Most of the consumers (82.5 %) did not know the content of acetaminophen. Approximately 86 % of consumers knew the proper recommended dose of acetaminophen 500 mg tablet per intake in adults while 50.0% knew the correct frequency of intake. Nevertheless, a few consumers (3.0 %) wrongly indicated that the frequency of intake is five to six times per day. Besides, majority of the consumers did not know the dose and frequency per intake for acetaminophen syrup formulation in children. Only 46.0% of the consumers were alert about interaction between acetaminophen and alcohol. A proportion of consumers correctly indicated that acetaminophen overdose can cause liver injury (26.8 %) and may cause fetal death and spontaneous abortion during pregnancy (19.5 %). Besides, 57.6% of consumers were not aware of the signs of acetaminophen over-consumption. A total of 65 % of the consumers understood that they should go to hospital immediately if they recognise the signs of acetaminophen overdoses and 42.5 % of them knew that there are treatments for acetaminophen poisoning (Table 2).

This study showed that majority of the consumers held positive perceptions towards the efficacy (statement 5 in Table 1) and safety (statement 1 in Table 1) of acetaminophen. The positive perceptions might lead to the popularity of acetaminophen used among the consumers [7]. Currently, the Malaysian government do not control the quantity of acetaminophen that could be sold among the consumers. However, more than half of the respondents viewed that the control of acetaminophen sales and decrement in the maximum pack size of acetaminophen products could minimize the risk of acetaminophen misuse and self-poisoning. Indeed, several developed countries have implemented policy to limit the quantity of acetaminophen tablets sales per transaction in order to reduce the risk of acetaminophen poisoning [15, 16].

Majority of the consumers perceived that the labelling of acetaminophen-containing product needs to be improve in order to control the misuse of such products. This finding was consistent with a previous study which revealed that instructions and warning attached to the blister card of OTC drug products could help to avoid the label being thrown away by consumers [17]. Another study in the United States showed that 74.4% of the consumers were not alert about new warnings label of liver damage while taking acetaminophen products [18]. Hence, there is a strong need to enhance the acetaminophen product labelling.

Lack of knowledge about the content (question 2 in Table 2), dosage for children (question 5, 6, 7, 8, 10 & 11 in Table 2), frequency of intake for children (question 9 in Table 2), drug interaction (question 12 in Table 2) and toxicity (question 13 & 14 in Table 2) of acetaminophen were found among more than 50% of the respondents. Previous studies from other countries also demonstrate poor knowledge regarding acetaminophen dosage for both adults [19] and children [20] among the consumers. Lack of awareness among the consumers regarding liver damage induced by acetaminophen overdose was also found in studies conducted in Australia [21] and United States [22]. These knowledge deficits need to be addressed in order to ensure appropriate use of acetaminophen. Within this context, healthcare providers should be more proactive in advising the consumers on the proper use of acetaminophen.

IV. CONCLUSION

This study provides insight into the positive perceptions of Malaysian consumers towards acetaminophen. Knowledge deficits regarding the content, dosage and frequency for children, drug interaction and toxicity of acetaminophen were found among more than 50% of the consumers. Prompt educational intervention is needed to address this issue.

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Table 1. Consumers' response to questions exploring perception of acetaminophen (paracetamol)

Survey questions/statement	Frequency (%)					
	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Don't know
1. Paracetamol is safe to use.	29 (7.3)	247 (61.8)	77 (19.3)	24 (6.0)	4 (1.0)	19 (4.8)
2. Paracetamol should be recommended to family or friends.	17 (4.3)	209 (52.3)	106 (26.5)	39 (9.8)	7 (1.8)	22 (5.5)
3. Paracetamol is cheap in price.	24 (6.0)	210 (52.5)	113 (28.3)	24 (6.0)	4 (1.0)	25 (6.3)
4. Paracetamol is very convenient to purchase	118 (29.5)	245 (61.3)	15 (3.8)	5 (1.3)	0 (0.0)	17 (4.3)
5. Paracetamol is very effective for minor and moderate pain.	70 (17.5)	257 (64.3)	40 (10.0)	10 (2.5)	3 (0.8)	20 (5.0)
6. Paracetamol should be kept in every house	52 (13.0)	266 (66.5)	46 (11.5)	16 (4.0)	1 (0.3)	19 (4.8)
7. There are too many choices of paracetamol products available in the market.	67 (16.8)	233 (58.3)	44 (11.0)	19 (4.8)	1 (0.3)	36 (9.0)
8. Reduction of maximum pack size of paracetamol will reduce paracetamol over-consumption and poisoning rate.	54 (13.5)	155 (38.8)	99 (24.8)	58 (14.5)	8 (2.0)	26 (6.5)
9. Better labelling can help to decrease the misuse of paracetamol.	91 (22.8)	204 (51.0)	33 (8.3)	50 (12.5)	4 (1.0)	18 (4.5)
10. Patients always ask for paracetamol when they visit the doctor.	42 (10.5)	117 (29.3)	105 (26.3)	73 (18.3)	14 (3.5)	49 (12.3)
11. Advertisement greatly influences consumption decision to purchase paracetamol.	55 (13.8)	200 (50.0)	76 (19.0)	49 (12.3)	5 (1.3)	15 (3.8)
12. The sales of paracetamol should be controlled	70 (17.5)	165 (41.3)	73 (18.3)	69 (17.3)	8 (2.0)	15 (3.8)

Table 2. Consumers' response to questions exploring knowledge of acetaminophen (paracetamol)

Survey Questions	Frequency (%)
1. What is paracetamol used for? (You may choose more than one answer)	
Headache*	358 (89.5)
Fever*	346 (86.5)
Constipation	1 (0.3)
Vomiting	10 (2.5)
Cough	7 (1.8)
Fit/seizure	3 (0.8)
2. What is the content of paracetamol? (You may choose more than one answer)	
Paracetamol*	55 (13.8)
Acetaminophen*	22 (5.5)
Ibuprofen	5 (1.3)

Acetylcysteine	5 (1.3)
Tramadol	2 (0.5)
I don't know	330 (82.5)

3. What is the dose of paracetamol tablet (500 mg tablet) per intake in adult?

1 - 2 tablets*	343 (85.8)
3 - 4 tablets	14 (3.5)
5 - 6 tablets	2 (0.5)
I don't know	41 (10.3)

4. What is the frequency of paracetamol tablet (500 mg tablet) intake per day in adult?

1 - 2 times	143 (35.8)
3 - 4 times*	200 (50.0)
5 - 6 times	12 (3.0)
I don't know	45 (11.3)

5. What is the dose of syrup paracetamol 120 mg/5 ml per intake in children aged 1 to 3 years old?

1 - 5 ml*	126 (31.5)
6 - 10 ml	16 (4.0)
11-15 ml	3 (0.8)
I don't know	255 (63.8)

6. What is the dose of syrup paracetamol 120 mg/5 ml per intake in children aged 4 to 6 years old?

1 - 5 ml	42 (10.5)
6 - 10 ml*	80 (20.0)
11-15 ml	9 (2.3)
I don't know	269 (67.3)

7. What is the dose of syrup paracetamol 250 mg/5 ml per intake in children aged 7 to 9 years old?

5 - 7 ml	33 (8.3)
8 - 10 ml*	45 (11.3)
11 - 15 ml	37 (9.3)
I don't know	285 (71.3)

8. What is the dose of syrup paracetamol 250 mg/5 ml per intake in children aged 10 to 12 years old?

5 - 7 ml	13 (3.3)
8 - 10 ml	33 (8.3)
11-15 ml*	63 (15.8)
I don't know	291 (72.8)

9. What is the frequency of syrup paracetamol intake per day?

1 - 2 times	90 (22.5)
3 - 4 times*	136 (34.0)
5 - 6 times	6 (1.5)
I don't know	168 (42.0)

Note: *Correct answer

Table 2. Continued

Survey Questions	Frequency (%)
10. What is the dose of paracetamol suppository in children aged 1 to 6 years old?	
125 mg*	94 (23.5)
250 mg	10 (2.5)
I don't know	296 (74.0)
11. What is the dose of paracetamol suppository in children aged 6 to 12 years old?	
125 mg	25 (6.3)
250 mg*	72 (18.0)
I don't know	303 (75.8)
12. Under what conditions paracetamol should be consumed with caution? (You may choose more than one answer)	
When you are taking alcohol*	184 (46.0)
When you are smoking*	51 (12.8)
When you are taking with other types of pain killers*	212 (53.0)
I don't know	119 (29.8)
13. What are the effects of paracetamol over-consumption? (You may choose more than one answer)	
Liver injury*	107 (26.8)
Renal damage *	205 (51.3)
May cause fetal death and spontaneous abortion during pregnancy*	78 (19.5)
I don't know	142 (35.5)
14. What are the signs of paracetamol over-consumption? (You may choose more than one answer)	
Changes in mental status/confusion*	97 (24.3)
Loss of appetite*	25 (6.3)
Abdominal pain*	66 (16.5)
Nausea*	91 (22.8)
Vomiting*	64 (16.0)
Diarrhea	15 (3.8)
I don't know	230 (57.5)
15. What course of action would you take if you recognize signs of paracetamol over-consumption?	
Go to hospital immediately*	263 (65.8)
Consult a doctor	104 (26.0)
Consult a pharmacist	33 (8.3)
Others	0 (0.0)
16. There are treatments for paracetamol overdoses/poisoning?	
Yes*	162 (40.5)
No	238 (59.5)

Note: *Correct answer