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A community based inter-cultural study on precipitating factors of headache

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Abstract

Background and Objectives: In the medical literature, there are considerable differences in the precipitating causes of headache from different cultures and geographical areas. This study aims to confirm this difference by studying two different cultures and geographical locations. *Methods:* A cross sectional study on headache sufferers from Kuala Lumpur, Malaysia and in Melbourne, Australia using similar inclusion criteria and a standard questionnaire. Patients with more than 6 headaches in the last year were included in the study. *Results:* 400 subjects were studied, 200 in each geographical area. The Male: Female ratio, severity of headache, type of pain and associated features were similar in both groups of subjects. There were significant differences in many triggering factors of headache in both groups. They were: heat, 63% in Malaysian subjects versus 24% in Australian subjects ($p<0.001$); exposure to sun, 49% in Malaysian subjects versus 24% in Australian subjects ($p<0.001$); change of weather, 23% in Malaysian subjects versus 13% in Australian subjects ($p=0.01$), and glare, 14% versus in Malaysian subjects versus 24% in Australian subjects ($p=0.01$). As for food, fried food ($p<0.001$), mutton ($p<0.001$), "heaty" food ($p=0.002$) were significant precipitating factors among Malaysian subjects as compared to the Australian subjects. There were also significantly more Malaysian subjects who resorted to drinking lots of water and taking "cooling" food as remedies for headache. This was consistent with the common cultural belief among Malaysians that "heatiness" causes headache.
Conclusion: This community based inter-cultural study confirms that significant differences exist in the triggering factors and remedies among Malaysian and Australian headache sufferers. These differences may be partly due to the different cultural beliefs.

INTRODUCTION

Other than stress, emotion, menstruation and sleep deprivation, there is wide variation in the attributed precipitating factors of headache in the literature, particularly the role of temperature and food.[1-8] For example, in a community survey in Malaysia, exposure to sun was the triggering factor for 52% of subjects with migraine, and 56% with tension headache.[8] In a community survey in the Republic of San Marino which has a Mediterranean climate, sun and weather were not mentioned as provoking factor for headache.[6] In a study from Finland, sauna-bath provoked headache in 18% of sufferers, second in importance only to stress.[4] A report of such an association is unusual although steam bath may be practiced elsewhere. However, these variations were based on studies using different inclusion criteria and questionnaires, particularly questions related to the precipitating factors of headache. This inter-cultural study aims to investigate whether there are significant differences in the precipitating factors of headache in two different cultures and geographical locations using similar inclusion criteria and a standard questionnaire.

METHODS

This was a cross sectional study on headache sufferers from two communities using a standard questionnaire in Kuala Lumpur, Malaysia and during summer in Melbourne, Australia. Five medical students trained in the questionnaire carried out the person-to-person survey in the public places. The inclusion criteria were subjects with more than 6 headaches in the last year. Subjects with medical illnesses which may cause headache, were excluded from the study. Less than 10 % of the subjects consisted of health care

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professionals or students. The survey subjects in Melbourne were local born Australians, or who migrated to Australia before their teens. The questionnaire included the demographic details: age, sex, race, education level, occupation; frequency and severity of headache, types of pain, triggering factors and remedies used. Statistical analysis were carried out using Student's t tests, and chi square tests where applicable. The Mantel Haenszel method to estimate relative risk was used to study the precipitating factors and remedies for headache with the subjects stratified by age.

RESULTS

Demography features of the study subjects

Four hundred subjects were studied, 200 each in Malaysia and Australia. The response rate was 100 % in both places. The mean age of the Malaysian subjects was 34.4 years while that of the Australian subjects was 43.7 years ($p< 0.001$). The age range was 10 to 80 years in Malaysian subjects and 8 to 81 years in Australian subjects. The Male: Female ratio was 1: 2.1 in Malaysian subjects and 1:1.9 in Australian subjects. The age distribution is as in Figure 1. The occupation of the Malaysian and Australian subjects were: Retired: 3%, 22%; Professionals: 20%, 23%; other workers: 26%, 28%; Housewife: 18%, 17%; Unemployed: 3%, 3%; Student: 30%, 7%. The education level of the Malaysian and Australian subjects were: Primary school: 9%, 8%; Secondary school: 45%, 58%; Tertiary: 46%, 34%. The racial distribution of the Malaysian subjects were: Chinese (60%), Malays (25%), Indians (14%), Caucasians (1.5 %), others (0.5%). The racial distribution of the Australian subjects were: Caucasians (94%), Chinese (3%), Vietnamese (1%), others (2%).

Characteristics of headache

The Malaysian subjects had a mean of 28.7 headaches a year, compared to the Australians who had 74.2 headaches a year ($p<0.001$). There was a lower prevalence of headaches among those younger than 15 years and older than 65 years in both the Malaysian and Australian population. The duration of headache in the Malaysian and Australian study subjects are listed in Table 1. There was no significant difference in the headache duration of the two groups.

There was no significant difference in the severity of pain in the two study groups. 31.5% of Malaysian versus 35.0% of Australian subjects had mild headaches (daily activities not affected); 52.0 % of Malaysian and 43.0% of Australian subjects had moderate headache (daily activities not interrupted); and 16.5% of Malaysian versus 22.0% of Australian subjects had severe headache (daily activities interrupted). The type of pain and the associated symptoms in the two study groups are listed in Table 2 and 3. There was no significant difference in the type of pain and associated features in the two groups.

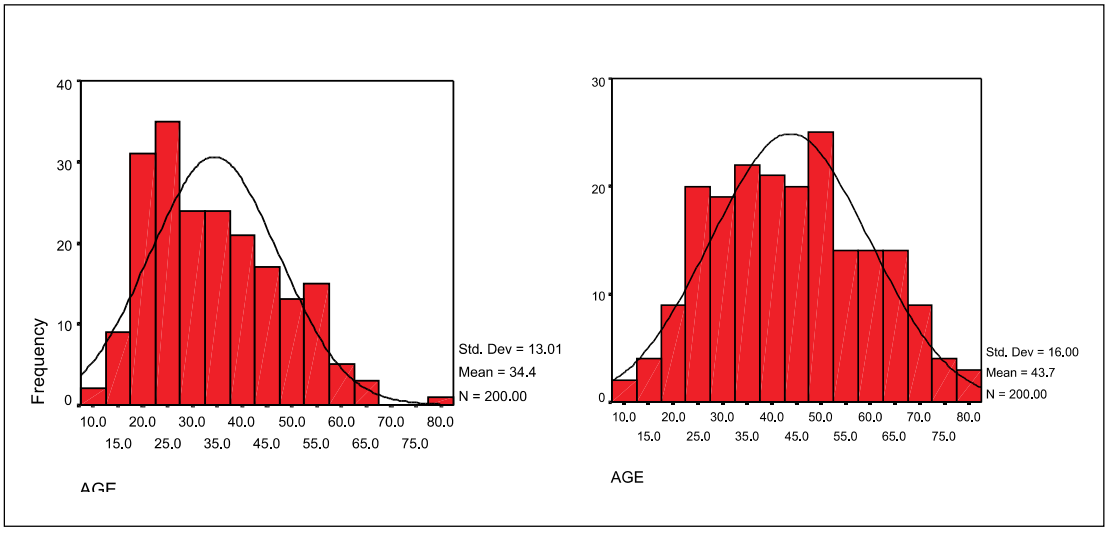

Figure 1: Age distribution of the study population in Malaysia (left) and Australia (right)

Table 1: Headache duration in the Malaysian and Australian subjects.

Duration of Headaches	Malaysian subjects (N=200)	Australian subjects (N=200)	P value
Less than 30 minutes	26.0 %	26.5 %	1.00
30 minutes to 4 hours	38.0 %	41.0 %	0.414
4 to 24 hours	21.5 %	22.5 %	0.904
24 to 72 hours	8.5 %	7.0 %	0.575
3 to 7 days	4.5 %	2.0 %	0.159
More than 7 days	1.5 %	1.0 %	0.653

Table 2: Type of pain experienced by the Malaysian and Australian subjects.

Type of Pain	Malaysian subjects (N=200)	Australian subjects (N=200)	P value
Pulsating	41.0 %	40.0 %	0.919
Pressing	21.0 %	28.5 %	0.104
Stabbing	5.5 %	6.5 %	0.674
Others	6.0 %	12.0 %	0.036

Table 3: Associated features of headaches in the Malaysian and Australian subjects.

Associated features	Malaysian subjects	Australian subjects	P value
Nausea	30.5 %	28.0 %	0.509
Vomiting	12.5 %	12.5 %	0.879
Photophobia	31.0 %	31.5 %	0.830
Flashing lights, bright spots	25.5 %	29.0 %	0.370
Others	7.0 %	3.5 %	0.117

Table 4: Precipitating factors of headaches in the Malaysian and Australian subjects.

Precipitating factors	Malaysian subjects (N=200)	Australian subjects (N=200)	P value
Sleep deprivation	71.0 %	49.0 %	<0.001
Stress	65.5 %	78.0 %	0.005
Heat	62.5 %	23.5 %	<0.001
Exposure to sun	48.5 %	24.0 %	<0.001
Exhaustion	42.5 %	35.5 %	0.183
Food	33.0 %	23.5 %	0.046
Emotion	31.0 %	28.5 %	0.663
Change in weather	22.5 %	12.5 %	0.008
Oversleeping	22.0 %	9.5 %	0.001
Menstruation	21.5 %	14.5 %	0.068
Acute illness	18.0 %	16.5 %	0.594
Glare	13.5 %	23.5 %	0.01
Exercise	4.5 %	10.5 %	0.023

Table 5: Food that has been linked to headache in the Malaysian and Australian subjects.

Type of Food	Malaysian Subjects	Australian Subjects	P Value
Fatty Food	11	4	0.065
Fried Food	21	2	<0.001
Chocolates	20	17	0.605
Oranges	4	2	0.411
Tomatoes	0	1	0.317
Pineapples	0	0	NA
Onions	1	1	1.0
Wine/Beer	21	21	1.0
Cheese	3	5	0.475
Tea	19	9	0.05
Mutton	10	0	0.001
"Heaty" food	20	5	0.002
Food rich in monosodium glutamate	12	3	0.018

Table 6: Remedies used by the Malaysian and Australian subjects.

Remedies for headache	Malaysian subjects	Australian subjects	P value
Analgesics	76.5 %	87.5 %	<0.004
Sleep	76.0 %	44.0 %	<0.001
Drink water	47.0 %	26.0 %	<0.001
Massage	45.0 %	19.0 %	<0.001
"Cooling" food	19.0 %	0.5 %	0.001
Herbal medicines	10.0 %	6.5 %	0.203
Outdoor activities	7.5 %	4.0 %	0.133
Relaxation	6.0 %	1.0 %	0.007
Ice pack	3.5 %	5.0 %	0.457
Others	9.0 %	15.0 %	0.065

Precipitating Factors of headache

Table 4 lists the precipitating factors of headache in the two study groups. The subjects were stratified by age and the precipitating factors for headache of the two study groups were compared. The differences in the precipitating factors of headache between the two study groups persisted with significantly more Malaysian subjects attributed their headache to sleep deprivation (OR 2.59; 95% CI, 1.69-3.95), heat (OR 5.75; 95% CI, 3.73-8.85), exposure to sun (OR 3.08; 95% CI, 2.00-4.73), food (OR 1.83; 95% CI, 1.15-2.91), change in weather (OR 2.02; 95% CI, 1.16-3.51), and oversleeping (OR 2.28; 95% CI, 1.26-4.13). More Australian subjects attributed their headache to stress (OR 1.83; 95% CI, 1.15-2.91) and glare (OR 1.74; 95% CI, 1.02-2.96).

Table 5 lists the type of food that precipitated headache in the two populations. As shown, significantly more Malaysian subjects attributed their headache to fried food, tea, mutton, "heaty" food and food rich in monosodium glutamate. After the subjects were stratified by age and the type of food that precipitated headache of the two study groups were compared, significantly more Malaysian subjects attributed their headache to "heaty food" (OR 5.33; 95% CI, 2.16-13.1)

Remedies for headache

Table 6 lists the remedies used by the two study populations for treating the headaches. As shown, significantly more Malaysian subjects resorted to sleep, massage, drinking lots of water and taking "cooling" food; whereas more Australian subjects

resorted to taking analgesics. After the subjects were stratified by age and the remedies used by the two study groups were compared, the differences in the remedies used by the two study groups persisted with significantly more Malaysian subjects resorted to sleep (OR 3.54; 95% CI, 2.30-5.44), massage (OR 3.18; 95% CI, 2.03-4.99), drinking lots of water (OR 2.48; 95% CI, 1.62-3.79); whereas more Australian subjects resorted to taking analgesics (OR 2.07; 95% CI, 1.18-3.64).

DISCUSSION

With the use of similar inclusion criteria and a standard questionnaire, this inter-cultural study confirms that there are significant difference in the precipitating factors of headache and some of the remedies used in two different cultures and geographical locations, Malaysia and Australia. The difference in the precipitating factors of headache included some the common factors such as sleep deprivation in Malaysian subjects, and stress in Australian subjects. It also involved some of the less common precipitating factors, which were: heat, exposure to sun, change in weather and food in Malaysian subjects, and glare in Australian subjects. The food mentioned to be particularly important among Malaysian headache sufferers were: fried food, tea, mutton, "heaty" food, and food rich in monosodium glutamate. The importance of exposure to sun and sleep deprivation as precipitating factors of headache among Malaysians[8], and that of glare among Australians[2] has been reported in previous studies.

We have also shown that there were no significant differences in the two groups in the sex ratio, severity of headache, type of pain, and associated symptoms. The Australian subjects were however older, reflecting the higher mean age of the Australian population as compared to the Malaysian. Analysis after age standardization of the data showed that most of the differences in the precipitating factors between the two study populations persisted.

It is unlikely that the differences in physical environment explain fully the all the differences in the precipitating factors of headache. For example, Malaysia has a tropical climate where the temperature throughout the year in degree Celsius is around mid-twenties to early thirties. During summer in Melbourne, during which the study was carried out, the temperature in Melbourne can reach a high of close to 40 degrees, yet significantly more Malaysian headache sufferers attributed their headache to heat and exposure to sun. Mutton is much more commonly consumed among Australians. Yet it is the Malaysian headache sufferers who attributed their headache to eating mutton. However, the Australians eat "lamb" mutton, whereas the Malaysians eat "goat" as well as "lamb" mutton.

Some of the differences in the precipitating factors of headache among Malaysian subjects can be understood by the cultural belief system of the Malaysians, i.e., "heatiness" as an explanation of headache. This commonly held concept of illness attribute all illness to five agents, "heat", "cold", "wind", "water", "poison" and the supernatural. "Heat" is the cause of such illness as dry mouth, sore throat, epistaxis, yellow expectorations, red eyes, constipation, dark concentrated urine, restlessness, pyrexia and headache. "Cold" on the other hand, causes illness such as rhinorrhoea, sneezing, chills, whitish expectorations, and cold extremities. "Heat" caused illness are believed to result from excessive ingestion of "heaty" foods, or over exposure to heat, like being in the sun for long periods. Foods considered "heaty" are fried food, meat from wild games, mutton, spicy food, and fruits like durians. "Cold" or "cooling" food may be taken to counter illnesses caused by "heatiness". [9]

Thus, the headache sufferers may have wrongly attributed their headache to these factors, and were not able to identify the correct precipitating factors. On the other hand, Wolff[10] and Moffat et al[11] had conducted placebo-controlled studies on chocolate as a provoking factor for migraine. Both studies involved subjects who found chocolate brought on their headaches. Yet when subjected to the studies, both chocolate and placebo were able to precipitate the headaches. Thus, belief system may by itself able to precipitate headache.[1]

Therefore the headache from sun exposure, heat and eating fried or "heaty" food in Malaysian subjects can be attributed to cultural beliefs. Some of the differences in remedies for headache used in the two populations may also be understood in this light, i.e., the common use of "cooling food" and drinking water as remedies for headache among Malaysian headache sufferers.

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