

## Some clinical, social and psychological characteristics of migraine subjects in the general population

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### Summary

A very careful enquiry within adequate sub-samples of the general population of a market town and its surrounding villages has revealed (a) no special relationship between so-called tension headaches and migraine as defined; (b) a two-year prevalence of migraine more or less similar to that reported elsewhere, i.e. approximately 10% of males and 25% of females being affected; (c) a greater prevalence of migraine amongst professional and managerial classes; (d) similar clinical features to those commonly described before; (e) that approximately 50% of the subjects had consulted their general practitioners and/or other doctors on account of the headache; (f) that actual migraine female subjects are significantly more anxious and depressed than normal subjects whilst at the same time reporting themselves as more sociable than others; they also complain more of other functional somatic disturbance; (g) that such differences were not always detected in the smaller male sample who showed similar tendencies only in respect of anxiety and other somatic complaint; (h) that subjects who described themselves on the questionnaire as having migraine but who were not on careful scrutiny always found to have it, showed as a population a higher degree of neurotic disability, including phobic avoidance patterns, than the population who actually have the condition.

This study supports the view that migraine is associated with certain psychological characteristics, especially amongst females. The profile is that of undefended dysphoria coupled with a definite tendency to be outgoing and engaging in the world. The price is migraine and other somatic complaint.

### Introduction

Although the clinical syndrome of migraine has

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been consistently described since antiquity, there remains doubt about its homogeneity. The diagnosis depends largely upon descriptions of symptoms. These necessary constituent and in fact quite common symptoms can, however, also occur in isolation from each other. Thus Waters (1973) has reported that headache, unilateral and bilateral, typical migrainous prodromata, nausea and vomiting can all exist independently of each other in the general population within a 12-month period; this to such an extent that they will frequently come together in the same subject by chance but especially if headache is severe. In this case they constitute the syndrome. Despite the derivation of the word migraine (hemicrania) many clinicians accept a syndrome of bilateral headache with warning nausea and/or vomiting as true migraine, but they then also point to the classical and unique neurological prodromata which can occasionally arise in such cases. Meanwhile the search for specific biochemical features and effective pharmacological treatments has not yet reached a point which allows any further clarification.

Certain precipitants of the syndrome are recognized clinically. They include certain foodstuffs, alcohol, climatic conditions, the premenstrual phase in women and emotional upset or strain. In contrast, tension headaches are often considered to be predominantly precipitated by the latter alone. It has been said that the disorder is more common amongst intelligent, striving, conscientious people and that in them it often follows at the end of a period of intense strain. Recently Henryk-Gutt and Rees (1973), studying a large number of civil service employees, concluded that the reported experience of migraine amongst them, twice as common amongst women as men, was associated with psychological stress as a common precipitant. Such

individuals also revealed, on standardized measures, higher levels of emotional reactivity as a constitutional quality. This study contributed important information but it suffers from having generated only a 54% yield of responses from the population, and from having had to rely for the diagnosis of migraine on the questionnaire information.

### The present study

The present study set out to deal with some aspects of these problems within a survey of the adult population of a Cotswold market town and its surrounding villages. The total population of this community amounted to about 5000 adult individuals all from the one group practice in the town.

### Method

Every fifth subject (listed by date of birth) was initially approached by letter and then, if there was no response, a follow-up letter through the general practice secretariat. A questionnaire was sent, aimed at eliciting information concerning the individual's experience of migraine and also aspects of his or her personality, psychoneurotic status, social status and other aspects of physical status.

### Migraine enquiry

The initial screening question was 'Have you ever had migraine? Answer Yes—No—Uncertain'. The aim, on receipt of this information, was to sample adequately all three response groups by means of intensive clinical interviews so as to be able ultimately to identify with clinical certainty representative groups of subjects with and without migraine. Thus, the migraine response groups

(Table 1), within sex, were treated as population strata and unequally weighted random samples selected from them for follow-up. Maximum precision was thus sought in the estimation of prevalence rates in the population through this follow-up screening of what amounted to 112 cases. The sample sizes are set out in Table 2, together with the numbers actually co-operating within the follow-up. Overall a co-operation rate of about 90% was achieved via further correspondence, including follow-up letters when necessary. These subjects, 101 in number, were interviewed by either A.H.C. or R.S.K. in their homes or in the group practice surgery. Interviews usually lasted about 40 min. Information was sought concerning the occurrence of migraine during the previous 2 years and its occurrence at any time during life. To define migraine, the authors had initially consulted with several neurologists specializing clinically in the disorder, and also the established literature. They concluded that the definition should comprise:

(a) Common migraine: a throbbing headache, unilateral or bilateral, together with definite nausea and/or vomiting and/or severe photophobia.

(b) Classical migraine: a throbbing headache, unilateral or bilateral, preceded by a warning (e.g. fortification spectra, hemianaesthesia), and secondly definite nausea and/or vomiting.

When, following the final interview, uncertainty about the diagnosis still existed in the interviewer's mind, the case was subsequently discussed in detail with a third 'expert' (one of the neurologists referred to above), and subsequently thereby allocated to the 'migraine' or 'no migraine' categories with the rest.

### Personality and psychoneurotic status measures

The Middlesex Hospital Questionnaire is a standardized, brief, self-rating inventory (Crown and Crisp, 1966, 1970) providing scores (0–16) on six scales, *anxiety*, *phobic*, *obsessional*, *somatic*, *depression* and *hysteria*. It has been found to discriminate well between psychiatrically ill and normal subjects, and scores in the latter group on many of the scales are related to age and sex (Crisp and Priest, 1971). All subjects in the original '1 in 5 survey' were asked to fill in this questionnaire.

TABLE 1. Migraine response groups (initial questionnaire data)

Questionnaire response	No. of males	No. of females
Yes	33	83
Uncertain	50	76
No	260	220
Total	343	379

TABLE 2. Population sample sizes chosen for further careful diagnostic scrutiny

Questionnaire response	Number of males		Number of females	
	Selected	Co-operated	Selected	Co-operated
Yes	15	12	25	23
Uncertain	18	16	27	27
No	11	11	16	12
Total	44	39	68	62

**Results**

*Initial enquiry*

Seven-hundred and twenty-seven subjects responded to the initial enquiry, these amounting to 75% of those approached and 82% of the eligible respondents, others having moved away from the district during the year preceding the enquiry. Of these, 722 answered the migraine question and all of them also completed the Middlesex Hospital Questionnaire (MHQ). Invalid sub-scale scores, owing to failure to answer one or more items, varied between 7.5% (obsessional scale) and 2.5% (anxiety scale) of the total number of subjects.

*Outcome of intensive interview study*

(1) *Final diagnosis and relationship to other forms of headache.* Table 3 shows that ten out of twelve males and twenty out of twenty-three females reporting migraine (answering 'Yes' to the migraine question) were ultimately found to have it. In addition, one-third of the females but far fewer of the males reporting uncertainty as to whether they had ever had migraine were subsequently found to have had it. None of those stating that they had never had migraine was found to have had it. In the process of this enquiry a number of subjects were found to have tension headaches, usually without also having migraine.

The diagnosis of common migraine was more clear-cut amongst females than males ( $\chi^2 = 5.61$ , 2 d.f.,  $P = 0.06$ ); no such significance was found for the differences in the diagnosis of classical migraine.

A comparison of migraine diagnosis and the diagnosis of other forms of headache shows that whereas amongst males the two are distributed independently of one another (Table 4) amongst

females they are clearly not. Thus, in the non-migrainous group of females 'other' headache (e.g. due to nasal sinus infection) was common. This was not so amongst migrainous females. Tension headaches were more or less equally common amongst migrainous and non-migrainous groups, both male and female.

(2) *Estimates of prevalence.* By weighting the populations within each stratum, the overall prevalence of migraine within the practice population was estimated. The prevalence rates were calculated both in terms of reported experience of migraine within the past 2 years, and also reported experience some time during life but not necessarily including the previous 2 years. Eighty-five per cent of identified male migraine sufferers and 76% of females similarly afflicted had experienced at least one attack during the previous 2 years. The previous 2-year prevalence rate was 8.9% for males (s.e. 2.4%) and 19.5% for females (s.e. 2.3%) (Table 5). The proportion of males and females who had had at least one attack some time during their life to date was 9.8% and 25.7% of the respective populations; these percentages having standard errors slightly lower than those given above.\*

*Social class.* The prevalence rates of migraine in the last 2 years were examined in relation to social class (Table 5) for both sexes, and higher rates were observed for social classes I and II than for III, IV and V (Registrar General's Classification). The differences were tested using a technique presented by Kish (1965); amongst females this difference was

\*The precision of these estimates is equivalent to that which would be expected from simple random samples of approximately 100 males and 167 females; a further adjustment downwards therefore could be made in order to allow for the actual population size.

TABLE 3. Distribution of headaches by self-report group by sex

	Migraine headaches	Non-migraine headaches		Total no. of headaches
		Tension	Other	
<b>Males (self report)</b>				
Positive (12)	10	1	0	11
Uncertain	2	8	3	13
Negative (11)	0	3	4	7
Estimated prevalence	9.8	28.8	30.3	68.9
<b>Females</b>				
Positive (23)	20	3	0	23
Uncertain (27)	9	10	6	25
Negative (12)	0	5	6	11
Estimated prevalence (%)	25.7	34.5	33.5	93.7

Since data on frequency of headache are incomplete on the non-migraine cases, these tables are concerned with life experience of headaches.

TABLE 4. Relationship of tension and other headaches to migraine

Other headache diagnosis	Males *		Females †	
	Non-migraine	migraine	Non-migraine	migraine
None	8	3	3	11
Tension	12	5	18	17
Other	7	4	12	1
Total	27	12	33	29

\*  $\chi^2=0.24$ , n.s.†  $\chi^2=13.7$ , d.f. = 2,  $P < 0.001$ .

TABLE 5. Two-year prevalence of migraine in relation to social class

Social class	Prevalence (%)	n
<b>Females</b>		
I, II	29.1 ± 7.0	21
III, IV, V	14.6 ± 3.3	40
Overall	19.5 ± 2.3	61
<b>Males</b>		
I, II	17.6 ± 6.5	8
III, IV, V	6.9 ± 1.4	31
Overall	8.9 ± 2.4	39

significant ( $z = 2.25$ ,  $P < 0.025$ , two-tailed), but amongst males, with a smaller sample, the difference, still in the same direction, was not significant ( $z = 0.447$ ).

**Frequency of attacks.** Amongst the current (previous 2 years) migraine sufferers the median frequency of attacks appeared to be higher amongst the males than the females. However, the difference was not significant.

**Precipitants.** Table 6 shows the extent to which the twelve males and twenty-nine females reported specific precipitants to their attacks. Thus tension is the most commonly reported precipitant in both men and women, followed by the menstrual period and mood change in women, and alcohol in men.

**Warnings.** Most subjects reported experiencing 'warnings' of an attack, usually visual (Table 7).

TABLE 6. Precipitants of migraine (individuals often reported more than one precipitant)

	Male	Female
Food	2	2
Missing a meal	2	1
Alcohol	4	1
Menstrual	—	7
Week-end	3	2
Season	2	3
Tension	6	16
Mood change	3	7
Relaxation	3	3
Others	8	11

TABLE 7. Prodromal features

	Male	Female
Gastrointestinal tract	0	4
Visual	7	10
Motor/sensory	2	2
Psychological	0	2
Other	3	1

**Associations.** Nausea and photophobia were common and vomiting occurred in about a third of the male and a fifth of the female cases (Table 8).

**Laterality.** The migraine headache was often bilateral or alternated between sides. Otherwise right-sided headaches appeared to be more common than left-sided ones but not significantly so with the small numbers involved (Table 9).

**Use of medical facilities.** Of the current migraine sufferers about 50% had consulted with their practitioner on account of their headaches (males 5/11, females 11/22), whereas 70% had used some form of drug treatment (males 8/11, females 15/22).

**Psychological status.** Analysis of the initial questionnaire screening data revealed a significant association between the positive report of migraine and high scores on anxiety, phobic, somatic and depression scales of the MHQ in both sexes. However the intensive study served to demonstrate that

TABLE 8. Accompaniments of headache

	Male	Female
Nausea	11	18
Vomiting	4	6
Photophobia	8	16

TABLE 9. Laterality of headache

	Male	Female
Right	3	7
Left	1	4
Alternate	1	5
Bilateral	6	6

subjects reporting by questionnaire that they had or might have had migraine were not by any means always correct. In contrast, there were no subjects reporting that they did not have migraine who were found to be wrong. Since one of the aims was to search for specific psychological characteristics of migrainous subjects, the authors were therefore entitled to compare their sample group of confirmed migraine cases with the large population of those subjects reporting no migraine by questionnaire. This latter larger population was very unlikely to contain any migraine sufferers although, if it did, they presumably tend to contribute MHQ scores which would if anything diminish the difference between the two groups.

than their non-migrainous counterparts. These differences are not accountable for in terms of age, since the age characteristics of the comparison groups are very similar in both males and females (Tables 10 and 11).

The obsessional score was not related to migraine status. When it was examined in terms of its two components (four questions related to obsessional personality and four to symptoms), there was a tendency, not statistically significant, for migraine subjects to show somewhat less in the way of obsessional traits than their non-migrainous counterparts. (Males: migraine  $4.0 \pm 2.2$ , non-migraine  $4.6 \pm 2.3$ ; females: migraine  $3.8 \pm 2.0$ , non-migraine  $4.5 \pm 2.4$ .) The populations were similar in report of obsessional symptoms.

**Discussion**

The hallmark of this study was intended to be the care and accuracy with which the identification of the categories migraine and non-migraine was achieved. The aim was thereby to be able to make a substantial statement concerning some psychological and social characteristics of migrainous subjects in general, bearing in mind the long history of reports in this respect concerning clinic populations of migraine subjects. In the event, their intensive study required the authors to focus down on small samples of individuals within the general population. This proved adequate in the sense of their being truly representative and gave the authors some significant findings. However, the small sample sizes left them with other findings that were only just short of being statistically significant. They are satisfied that in the end they achieved a high degree of accuracy of categorization according to their operational definitions of migraine. The study revealed that a substantial number of people who report on questionnaire having migraine do not in fact have it. Individuals who report uncertainty in this respect may or may not have it. Equally carefully investigated were subjects who reported never having migraine and this was found always to be true.

It should be noted that the measures of psychoneurotic personality and illness used in this study were applied at a point in time and subsequently examined in relation to a diagnosis of migraine over a 2-year period in individuals actually interviewed about 9 months after completing the questionnaire. It is assumed that, overall, the measures of psychoneurosis reflect the psychological status of the people concerned during the preceding two years. This is a reasonable assumption in that many of the psychological qualities measured are relatively stable over periods of years. Moreover, in the event, the measure yields results that distinguish between the migraine and non-migrainous groups.

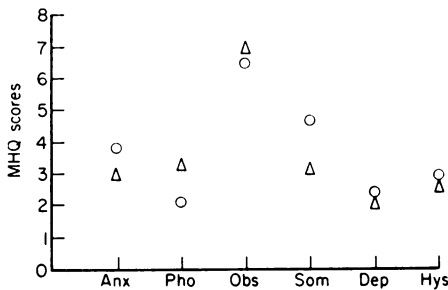


FIG. 1. Mean subscale MHQ scores for migraine, ○ and no migraine groups, △ (males).

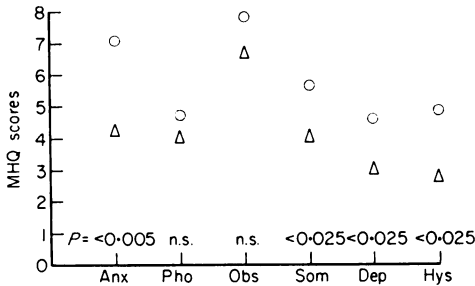


FIG. 2. Mean subscale MHQ scores for migraine, ○ and no migraine groups, △ (females). (Where differences are significant, this is noted.)

Figures 1 and 2 display mean sub-scale scores of male and female migrainous and non-migrainous subjects. Whilst there is a tendency for the smaller male sample of migrainous subjects to be more anxious, somatic and less phobic than their non-migrainous counterparts, these differences are not statistically significant. Amongst the females, however, the migrainous subjects show distinctly more anxiety, somatic complaint, depression and hysteria

TABLE 10. Means and standard deviations of subscale scores of migraine and no migraine groups, and numbers of subjects in each group : males

Group	Anxiety	Phobic	Obsessional	Somatic	Depression	Hysteria	Age
Migraine							
Mean	3.8	2.2	6.5	4.6	2.4	2.8	44.3
s.d.	2.9	2.4	2.1	3.1	3.0	2.5	11.2
<i>n</i>	12	12	12	12	12	12	12
No migraine							
Mean	3.1	3.2	6.9	3.0	2.4	2.8	45.8
s.d.	3.0	2.5	2.7	2.2	2.6	2.6	5.8
<i>n</i>	91	90	84	90	92	89	92
<i>t</i> -Test	0.80	-1.2	-0.3	1.6	—	—	0.45
<i>P</i>	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.

TABLE 11. Means and standard deviations of subscale scores of migraine and no migraine groups, and numbers of subjects in each group: females

Group	Anxiety	Phobic	Obsessional	Somatic	Depression	Hysteria	Age
Migraine							
Mean	7.0	4.6	7.7	5.6	4.5	4.7	42.1
s.d.	3.7	2.6	3.4	2.9	2.8	3.4	11.3
<i>n</i>	29	29	29	29	29	29	29
No migraine							
Mean	4.3	4.0	6.8	4.1	3.0	2.8	44.8
s.d.	3.2	2.6	3.1	2.9	2.2	2.7	6.5
<i>n</i>	75	73	74	72	76	71	76
<i>t</i> -test	3.42	0.95	1.33	2.3	2.5	2.5	1.12
<i>P</i>	<0.005	n.s.	n.s.	<0.025	<0.025	<0.025	n.s.

Tension headaches were equally common amongst migraine and non-migrainous subjects suggesting that these two very common headache syndromes are often independent phenomena. Amongst the migrainous population most individuals clearly described them as separate entities. In a few, an initial tension headache sometimes developed to take on the qualities of migraine within the one attack.

Migraine is a common condition, having occurred in about 25% of all women and 10% of all men by the time they have on average reached middle life. It is more common amongst professional and managerial classes than other social classes for both sexes. Approximately 50% of the migraine population has sought medical advice, this finding being in accord with that of Waters and O'Connor (1971).

The present findings concerning the clinical features are also more or less in accord with previous reports. Thus emotional, social, climatic and dietary precipitants are prominent amongst those reported. The authors' definition of common migraine required the presence of nausea/vomiting and/or severe photophobia. Nausea and photophobia, sometimes occurring together, were common. Overall, vomiting occurred less frequently. Sur-

prisingly, it was more common in males than in females. The 'warnings' of those cases thus identified as classical migraine were most commonly of a visual kind.

Migraine has often been regarded as a psychosomatic disorder. Very rarely it appears to be dependent upon gross cerebral vascular malformations but usually the accompanying cerebrovascular disturbance is presumed to be of a functional kind. As already mentioned, prominent amongst reported precipitants are a number of social and psychological factors and even the dietetic and biological precipitants can often be construed as having important psychological connotations. The psychosomatic proposition usually incorporates the notion of a physical predisposition (in this case an idiosyncratic cerebrovascular responsivity) or a noxious agent or substance, and an experiential factor which can only be understood in terms of the stress for the personality which it confronts. Other features of such personalities will include a propensity for striving in life rather than deployment of avoidance mechanisms and other neurotic coping devices. Such individuals would therefore be likely to have neurotic character structures rather than evident psychoneurotic symptomatology.

Previous studies of other conditions also thought to be 'psychosomatic' have shown the fallacy of exploring such propositions on clinic populations alone. The latter often show a high degree of psychoneurosis because this quality will be over-represented amongst those who complain of and seek attention for their disabilities (Crisp, 1968). At the same time the sterner task of exploring character structure has rarely been attempted with either clinical or general populations. Those who hold that all disease has a psychosomatic component, rather than emphasizing a particular psychosomatic personality might instead claim importance for the relevance of particular life events for any one individual, or else advance the proposition that specific diseases are associated with specific personality qualities. In the present study the authors have used a standardized measure of psychoneurosis, both of symptoms and aspects of personality, which has allowed them to test the notion that migraine subjects would, as a population, display high levels of anxiety and obsessiveness, especially in terms of traits, and relatively low levels of phobic avoidance mechanisms and depression, this tentative hypothesis being rooted in some of the above concepts and the authors' own clinical 'hunches'.

Initially the authors found that those reporting on questionnaire having experienced migraine were indeed characterized as a population by significantly high levels of psychoneurosis. The intensive study led to some modifications of this finding in respect of actual migraine. In the event they can most usefully discuss the female population of migraine subjects. The group of male subjects was probably not large enough to reveal significant differences between it and the non-migrainous male population, although there were tendencies for it to display more anxiety, higher levels of somatic complaint and less phobic avoidance qualities. The female migraine population was characterized by high levels of anxiety but with no comparable excess of anxiety avoidance mechanisms. It also displayed relatively and significantly high levels of depression and other somatic complaint. Migraine subjects, male and female, showed no excessive obsessional traits, such qualities as being unduly conscientious, methodical and punctual and concerned with cleanliness. If anything, they displayed these characteristics to a somewhat lesser extent than the non-migrainous population of comparable age.

The findings concerning anxiety are largely in accord with those derived by the questionnaire study of Henryk-Gutt and Rees (1973): they found a large

London office population of migrainous subjects, male and female, to be characterized by increased 'neuroticism' scores on the Eysenck Personality Inventory (EPI), a standardized measure of this quality and also of extroversion/introversion (Eysenck & Eysenck, 1964). The female population also showed high levels of 'anxiety' and 'somatization' as measured by the MMPI, an American standardized measure of personality traits. Meanwhile Waters and O'Connor (1971), in their extensive epidemiological survey combined with a clinical examination of sub-group samples, found only an insignificant tendency for such subjects to display more 'psychoneurosis' using, however, the Cornell Medical Index Health Questionnaire for this purpose, an instrument that presumes a global quality to psychoneurotic illness. Finally, the female population in the present study scored high on the hysteria scale. This scale, less satisfactory than the others in terms of validity, in fact appears to measure introversion/extroversion, and scores are also closely related to age (Crown and Crisp, 1970). Such high scores in the present population reflect a relatively high degree of responsiveness and concern with social and external values, this occurring in the present population in association with high levels of anxiety.

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