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Menstruation and Personality

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This investigation is concerned with the prevalence of dysmenorrhoea and premenstrual symptoms in the general population and with their relationship to personality.

Many authors have expressed the opinion that such relationships exist, but we will confine our review here to those studies which have presented supporting data. Wittkower and Wilson (1940) studied 57 patients with primary dysmenorrhoea and found there was a history of childhood maladjustment four times as often in these patients as in a control group. They considered that patients with dysmenorrhoea could be classified into two main personality types: the first, "characterized by deep resentment of their feminine role"; the second, "obviously immature physically and either shy or shut-in or chronically anxious and complaintive". Sainsbury (1960) observed a significantly raised neuroticism score on the Maudsley Personality Inventory for patients attending hospital for dysmenorrhoea. Such views as these are not universally held, and would certainly not be shared by many gynaecologists. Nor are they supported by the little evidence forthcoming from population studies.

The prevalence of dysmenorrhoea is high, especially among young girls. Golub (1958) found it in 68 per cent. of school girls. Drillien (1946) found it in 50 per cent. of service women. In view of these findings one must interpret with caution the reports of Gregory (1957) and O'Neill (1951) who reported incidences of 66 per cent. and 75 per cent. in their respective series of neurotic women. Schuck (1951) analysed the medical histories of 800 New York students he had previously questioned about menstrual pain. He concluded that "psychoneurosis was no more frequent in those cases allied with essential dysmenorrhoea than in a control group with normal menses".

Since Frank (1931) described the premenstrual tension syndrome there have been many papers confirming that in some women there are marked psychological changes occurring with menstruation. The most frequent symptoms reported include feelings of tension, irritability, depression, headaches and swelling of the breasts and abdomen. These symptoms are said to be most severe in the days before menstruation, and to be relieved by the onset of the period. Apart from these symptoms there is also objective evidence of psychological changes at this time. Cooke (1945) reported that 84 per cent. of crimes of violence in women were committed during the premenstrual phase. MacKinnon and MacKinnon (1956) found that women who died from accident or suicide did so very much more frequently in the premenstrual than at other times, and Thin (1962) has also shown this for attempted suicide. Dalton (1959, 1960, 1961) has shown that an excess of accidents and crimes occurred before and during menstruation, which was also the time of greatest liability to admission to hospital with an acute psychiatric illness.

The relationship between the premenstrual syndrome and personality was investigated in 145 normal and psychiatric subjects by Rees (1953). He found that it occurred more frequently in neurotic than in normal subjects, and that there was a correlation between the intensity of premenstrual tension and neurotic predisposition. Some very neurotic women, however, had no premenstrual tension. The results of treatment also indicated there was no simple relationship between neuroticism and premenstrual tension. Neurotic women who improved psychologically with psychotherapy did not necessarily improve in their premenstrual tension. Rees concluded that physiological as well as psychological factors were important.

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There is little information on how frequently these premenstrual symptoms occur in the general population and how their prevalence and severity vary with age and parity. Bickers and Woods (1951) reported that 30 per cent. of women in a factory applied for treatment of these symptoms. Pennington (1957) suggested that 95 per cent. of American women suffered from premenstrual symptoms at one time or another.

The varied estimates of the prevalence of menstrual symptoms arise from differences in the unrepresentative groups of the population that have been investigated and also, where *patients* have been studied, from the different selections made. Not all women with menstrual symptoms complain to their doctors, not all of those who do so are referred to a gynaecologist, and fewer still reach the psychiatrist; important selective factors are at work and must bias any study based on a patient group.

Reliable conclusions about the significance of psychological factors require first of all a knowledge of the prevalence of menstrual symptoms and secondly the correlation of such symptoms with personality type in a sample derived from the general population. Indeed the influence on symptoms of such factors as age, civil state and parity makes comparison with a normal population group mandatory.

For these reasons we considered that a standard questionnaire approach to a sample of the general population would produce the most consistent and reliable information about these symptoms. We could not share the view put forward by Davis (1938) in his comprehensive monograph on dysmenorrhoea that "it is advisable to discount statistics based upon questionnaires, depending as they do upon the patient's own assessment of her disability". Who but the patient experiences her symptoms? Who else can be competent to assess them? It should be emphasized, however, that this enquiry deals only with symptoms and provides no evidence of the subject's behaviour during menstruation.

Method

Five hundred women of menstrual age were chosen from different areas of England by a two-stage sampling method. Ten general practitioners (known to one of us or obtained from the research register of the College of General Practitioners) were approached and from the list of each a random sample of 50 women between the ages of 18 and 45 years was drawn. Thus the first sampling stage was not random; if the method of selecting practitioners introduced a bias, randomizing the second stage could not eliminate this. Checks were therefore built into the design so that we could tell if the results from any one practice or type of practice were atypical.

After a pilot study had been made on fifty subjects a definitive questionnaire was drawn up concerning menstrual symptoms; details of marital state, parity and age were also asked. The questionnaire, together with the Maudsley Personality Inventory, was posted to each subject with a covering letter outlining the purpose of the investigation. As command of English is necessary to complete the personality inventory we excluded any woman whose name clearly indicated that English was not her first language. Seventy-six subjects were replaced by others from the same doctor's list, usually because we learned that they had moved away but occasionally because they told us that they were no longer menstruating. Otherwise, no subject was replaced. If no reply had been received, follow-up letters were sent at intervals of one, two and four weeks after the original enquiry.

The distribution of the practices and the response to the questionnaire are shown in Table I. Fifty-four per cent. of the sample responded to the initial approach, 80 per cent. after one reminder and 89 per cent. after two. The third reminder raised the response rate to the very satisfactory level of 93 per cent.

The Questionnaire

Questions were asked about pain, irritability, depression, anxiety, nervousness or tension and headaches. Subjects were asked to rate these on a four-point scale: nil, slight, moderate and severe. They were also asked about swelling of the body, having simply to indicate whether this was present or absent and its site. For each of these symptoms they were asked the time, in

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TABLE I

The Practices and the Sample

Area	No. of G.P.s	Sex of G.P.s	Sample Size	Forms Returned	
				No.	%
London: Wimbledon	1	F	50	47	94
London: Bloomsbury	1	F	50	48	96
London: Kentish Town	4	M	200	189	95
Large town: Bradford	2	M	100	93	93
Small town/rural: Windermere	2	M	100	88	88
All practices	10		500	465	93·0

relation to the periods, when it was worst, and also whether they suffered from the symptom at other times. Other questions concerned regularity of the menses, and subjects were asked to state whether they reduced their normal daily activity during them. Respondents were asked their age (which in every case tallied with the general practitioner's information), their civil state and their parity. We also enquired whether or not they were menstruating at the time of completing the form. Except for these last personal questions all other responses were made by putting a cross in an appropriate box.

Finally, each subject was asked to complete the Maudsley Personality Inventory (M.P.I.). This gives two measures of personality: neuroticism and extraversion. Neuroticism is defined as the general emotional lability of the personality, his emotional over-responsiveness and his liability to neurotic breakdown under stress. Extraversion refers to the outgoing social proclivities of a person (Eysenck, 1959). These personality scales have been shown to have a satisfactory reliability and validity. The neuroticism scores of various neurotic populations have been found to be consistently and significantly higher than that of normal populations.

Information from the questionnaires was transferred to punch cards for statistical analysis. Where two factors were either quantitative (e.g. M.P.I. scores) or merely orderable (e.g. dysmenorrhoea, irritability) the association between them was examined by reference to Kendall's (1955) rank correlation coefficient (7). Where quantitative variables have had to be compared between groups which are not orderable (e.g. M.P.I. scores in various G.P. practices) Student's "t" test has been used. No result was considered to be statistically significant unless P was less than 0·01.

RESULTS

The age, civil state and parity of the sample are shown in Table II overleaf. There is a small deficit of women aged 18–19 and aged 45 but otherwise the sample is unremarkable.

Twenty-two per cent of the women were menstruating at the time of completing the form. This is slightly but not significantly higher than would be expected on the basis of a 5-day flow and a 28-day cycle. We learned that some women had kept the questionnaire until their next period before completing it. Those menstruating when they filled in the form did not differ from the rest in respect of the frequency or severity of menstrual symptoms, nor in their scores on the personality inventory.

Eighty-two per cent. of the women had regular periods. Three per cent. were unsure if they were regular or not and 16 per cent. did not know when the next one would come because they were so irregular. The neuroticism scores of women with irregular periods is

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TABLE II

Age, Civil State and Parity of Subjects

Age	18–19	20–24	25–29	30–34	35–39	40–44	45	N.K.
No. of subjects	23	82	93	88	88	82	7	1

Civil State	No.	%	Size of Family (Wives and Widows)				
				0	1	2	3	4 or more
Single	126	27·2	No. in family					
Married	329	71·2	No. of subjects	69	92	91	53	30
Widowed	8	1·7						

significantly higher than that of women with regular periods (Table VII p. 717).

The prevalence of the various symptoms is shown in Table III and the time when they are worst in Figure 1. Correlations that were found between symptoms and between symptoms and M.P.I. scores are shown in Table IV. These tables and this figure should be consulted when the results for individual symptoms are described in turn.

Dysmenorrhoea

Dysmenorrhoea is experienced to a severe degree by 12 per cent. and to a moderate or severe degree by 45 per cent. of all subjects. It is maximal on the day the period starts. Its prevalence is unaffected by marriage but declines with parity; severe period pain is experienced only half as frequently following the birth of the first child, and moderate symptoms are reduced after the second (Table V). This negative association of pain and parity is statistically significant. There is a similar negative correlation between pain and age; however, using partial rank correlation coefficients, we have been able to show that the reduction of dysmenorrhoea with parity remains statistically significant even when the effect of age is controlled. Dysmenorrhoea is the most

TABLE III

Prevalence and Severity of Menstrual Symptoms
(Percentages)

Symptoms	n	Moderate Degree	Severe Degree
Pain	463	32·8	12·3
Headache	459	10·5	11·3
Irritability	463	20·9	11·4
Depression, anxiety nervousness or tension*	459	17·2	6·1
Swelling†	457	71·8 reported some swelling	

* Subjects were asked to select which of these words best described how they felt: 54 per cent. said depressed, 30 per cent. tense, 10 per cent. nervous, 6 per cent. anxious.

† Eighty per cent. of those reporting swelling mentioned "stomach or abdomen", 54 per cent. mentioned breasts, 9 per cent. mentioned feet or ankles.

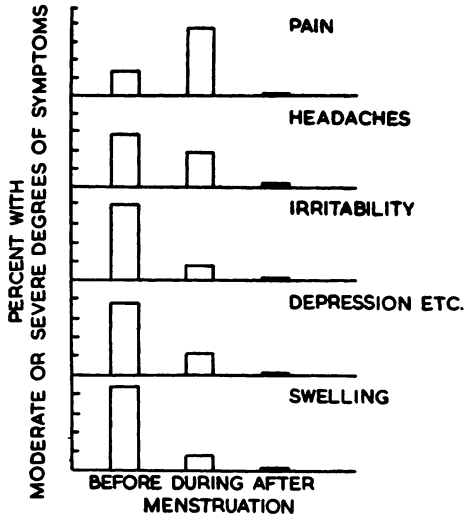


FIG. 1.—The time, relative to menstruation, when the various symptoms were reported to be at their worst.

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TABLE IV
Correlations

	Pain	Irritability	Depression	Headaches	Swelling	Effect on Life	Parity
Irritability ..	0·226*						
Depression, etc. ..	0·158*	0·600*					
Headaches ..	0·148*	0·174*	0·200*				
Swelling	0·152*	0·198*	0·167*	0·135*			
Effect on Life ..	0·369*	0·283*	0·268*	0·225*	0·113		
Regularity ..	−0·096	−0·104	−0·114	−0·087	0·003	0·078	
Parity	−0·137*	0·042	0·046	0·204*	−0·019	−0·036	
Neuroticism ..	0·107	0·256*	0·297*	0·190*	0·195*	0·199*	0·113
Extraversion ..	−0·006	−0·058	−0·113	0·005	−0·027	0·010	0·043
Age	−0·123*	0·010	−0·014	0·127*	0·028	−0·041	0·197*

Rank Correlation Coefficient r

* $P<0·01$.

TABLE V
The Effect of Marriage and of Parity on Dysmenorrhoea and the Premenstrual Syndrome

	Single Women	Wives and Widows			
		Number of Children			
		0	1	2	>2
n=	126	69	92	91	83
Percentage with severe or moderate dysmenorrhoea ..	52·4	56·5	48·9	31·9	34·9
Percentage with severe dysmenorrhoea	15·9	18·8	8·7	10·9	7·3
Percentage with severe or moderate irritability ..	19·1	33·3	32·6	31·2	36·2
Percentage with severe irritability	5·6	8·7	12·9	11·6	12·7

important of all menstrual symptoms in causing reduction of everyday activity (Fig. 2 overleaf).

Dysmenorrhoea is significantly correlated with menstrual irritability, depression, etc., headaches and sensations of swelling.

There is no significant correlation of dysmenorrhoea with neuroticism.

Psychological Symptoms

Each subject was questioned about menstrual irritability and also whether she became depressed, anxious, nervous or tense around the time of her period, and she was asked to select which of these words best described how she felt at the time. In addition to irritability, most women who experienced psychological symptoms selected depression and tension as the best descriptive words.

These symptoms are worst *before* the period starts. They are significantly correlated with

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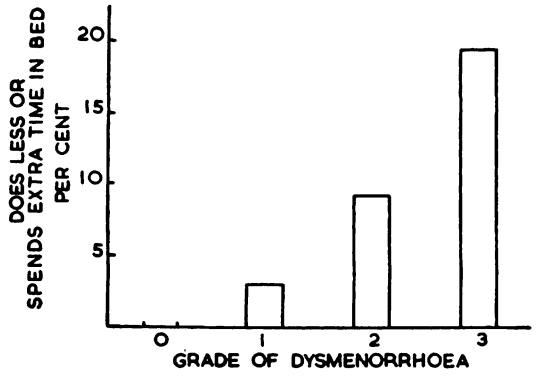


FIG. 2.—The effect of dysmenorrhoea on the subject's everyday activity.

headaches, swelling and reduction in activity during menstruation. All these symptoms are significantly correlated with neuroticism. This very significant association is illustrated in Figure 3 in which neuroticism scores are seen to increase with increasing grades of irritability which we may take as the key psychological symptom. These symptoms are also highly correlated with each other (Fig. 4).

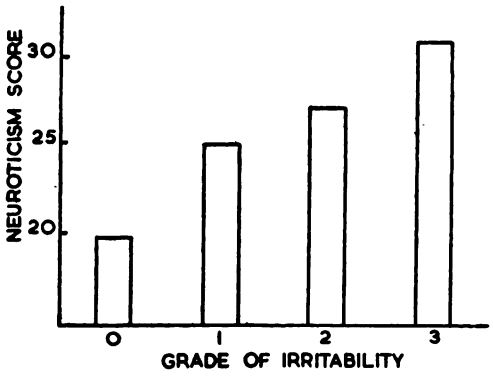


FIG. 3.—Neuroticism and Irritability.

These symptoms are correlated neither with parity nor with age. Irritability was significantly increased by marriage but not affected by subsequent childbirth (Table V, p. 715).

Menstrual Headaches

Menstrual headaches, although they show a slight preponderance before the period begins, are more evenly distributed before and during the cycle. The table of correlations shows an

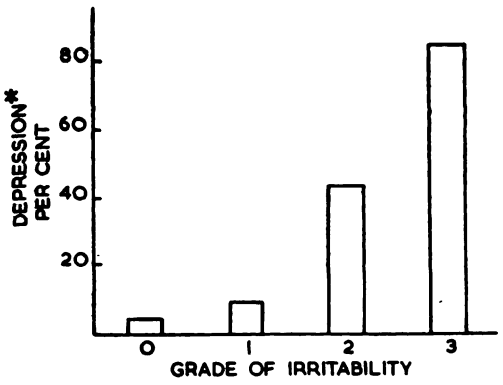


FIG. 4.—Depression and Irritability.
* Depression, anxiety, nervousness or tension.

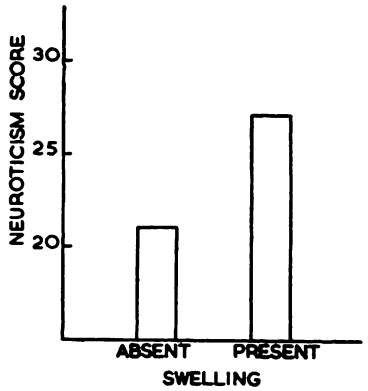


FIG. 5.—Swelling and Neuroticism.

association with dysmenorrhoea and other menstrual symptoms, and also that headaches play a part in reducing normal activity during the periods. In contrast to dysmenorrhoea, headaches are positively correlated with age and parity. They are also correlated with neuroticism even after partial correlation eliminated their association with other premenstrual symptoms.

Swelling

Subjects were asked if they got any swelling of the body round about the time of their periods, and if so, to state where it occurred. No less than 72 per cent. reported some swelling, and of those who did, four-fifths cited the breasts and half mentioned the abdomen; only a tenth indicated feet or ankles and there

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were negligible numbers mentioning face, neck, fingers or knees. The symptom was markedly worst premenstrually. Swelling was correlated with most of the other menstrual symptoms. Even after a partial correlation eliminating this association, swelling was significantly correlated with neuroticism (Fig. 5).

Reduction of Everyday Activity During the Periods

Each subject was asked to assess the effect of the period on her everyday life. Table VI shows that 21 per cent. of women reduced their activities but that only 7 per cent. were appreciably affected by their menstrual period. One woman in thirty-six spent some extra time in bed.

TABLE VI

Activity During Menstruation (Percentages)
(n=461)

Lead usual life without any trouble ..	43·0
Lead usual life but find it a strain ..	37·1
Take things a little more easily	14·1
Definitely do less	3·9
Spend some extra time in bed during the day	2·8

Maudsley Personality Inventory

Many of the significant correlations between menstrual symptoms and the M.P.I. have already been indicated. Other results are shown in Table VII. The mean neuroticism score of the women is higher than Eysenck's (1959) published normals, 19·9, which is for both sexes combined. However, he reports that women have higher neuroticism scores than men and this may account for some of the difference. The mean extraversion score for the group differs very little from his published normal mean score of 24·9. Neuroticism and extraversion were found to be negatively correlated with age and there was a significant correlation between neuroticism and extraversion.

The M.P.I. neuroticism scale contains several questions that may be influenced by periodic symptoms. Thus a subject with dysmenorrhoea might very well answer "Yes" to the question: "Are you sometimes bubbling over with energy and sometimes very sluggish?" To detect any such possible contamination all questions that may have been influenced by menstrual symptoms were eliminated and a revised neuroticism score of 16 questions was made (the questions removed were numbers 2, 7, 10, 11, 17, 26, 35 and 47). Samples of 50 women without premenstrual psychological symptoms and 50 women with one or more severe premenstrual psychological symptoms were selected and the revised neuroticism score was calculated for each subject. Results of this procedure are shown in Table VIII. Both the original and

TABLE VII

Maudsley Personality Inventory Scores

	Neuroticism			Extraversion		
	Mean	S.D.	P	Mean	S.D.	P
All	25·2	10·6		24·8	9·3	
Menstrual regularity:						
Regular	24·3	11·0	<0·001	25·0	9·1	N.S.
Irregular	28·9	9·5		24·7	9·9	
Irritability:						
Nil or slight	23·5	10·3	<0·01	25·4	8·7	N.S.
Moderate or severe	28·6	10·1		23·6	9·1	
Dysmennorrhoea:						
Nil or slight	24·2	10·2	N.S.	24·8	8·6	N.S.
Moderate or severe	25·9	10·5		25·9	9·1	

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TABLE VIII

Revised Neuroticism Scores

	50 Women without Premenstrual Irritability or Depression		50 Women with Severe Premenstrual Irritability and/or Depression		
Neuroticism score (N) ..	19·6	S.D. 10·1	31·8	S.D. 10·5	P=0·001
Modified score*	12·3	S.D. 6·6	19·4	S.D. 7·7	P=0·001
Correlation between N and modified score	0·91		0·97		

* Modified score is the Neuroticism scale with all questions likely to be affected by menstruation eliminated. This left 16 questions out of 24.

revised neuroticism score differentiated the two groups very significantly. For both groups the correlation between the two scores is very high, and it appears that the questions eliminated were not significantly affected by menstrual disorders and therefore these questions were not responsible for the high neuroticism scores we have found.

There is other evidence that the subjects with premenstrual symptoms had abnormal personality traits. Each subject was asked to state whether she had similar symptoms at other times than with her periods. The results for the question about irritability are shown in Table IX and similar results were obtained from the other symptoms. It appears that a woman who complains of premenstrual irritability is more likely to be irritable at other times as well, and it therefore seems as though premenstrual symptoms are an exacerbation of personality traits which in turn are related to neuroticism.

TABLE IX

Irritability During Menstruation and at Other Times

	Irritable at Other Times	Not Irritable at Other Times
Menstrual irritability present*	80	62
No menstrual irritability ..	113	189
χ^2 14·85; P<0·001		

* Marked and severe only.

Differences Between Practices

There were only slight differences in the prevalence of menstrual disorders between the various practices, and in the response to the M.P.I. (Table X). There were significantly low neuroticism scores from the Bloomsbury practice and high neuroticism scores from Bradford. Significantly low extraversion scores came from both the provincial practices. Menstrual irritability was also significantly low in Bloomsbury.

The reasons for these differences probably lie in the marital state and social class of subjects in the various practices. The Bloomsbury practice consisted of a large proportion of university students of whom only 30 per cent. were married. Bradford had a large proportion of married women (79 per cent.). Eysenck reported that neuroticism scores are lower with higher social class and also in this investigation we found that menstrual irritability was the only factor of importance that correlated with marital state.

Women doctors ran the Bloomsbury and Wimbledon practices and it is noteworthy that their patients did not have any increased prevalence of menstrual symptoms.

Late Responders

We examined whether there was any difference in M.P.I. scores or symptoms reported by women requiring different amounts of reminding before they returned the form. Table XI shows that this is not the case. This is a point of some importance, for if there were a trend towards greater or less prevalence we would have to assume that non-responders would be even more extreme. We cannot say anything definitely about non-responders (7

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TABLE X

Menstrual Symptoms, Neuroticism and Extraversion in the Different Practices*

	Pain	Irritability	Depression	Neuroticism Score	Extraversion Score
	Present* %	Present* %	Present* %	Mean	Mean
Bradford	49·4	34·4	24·7	27·97	23·24
Windermere	43·2	37·5	21·6	24·61	23·0
Bloomsbury	36·2	19·2	17·0	21·98	25·08
Kentish Town	45·0	32·8	23·8	25·11	26·28
Wimbledon	48·9	29·8	25·3	24·24	26·25
	45·2	32·3	23·1	25·16	24·80

* Includes moderate and severe.

Neuroticism score of Bradford is significantly higher, and that of Bloomsbury is significantly lower than the rest of the practices ($P<0·01$).

Extraversion scores of Bradford and Windermere are significantly lower than the London practices ($P<0·01$).

Prevalence of irritability significantly low in Bloomsbury compared to the rest of the sample ($P<0·01$).

TABLE XI

Number of Reminders and Response to Questionnaire

	Number of Reminders			
	0	1	2	3
Depression, etc. (%)* ..	26·0	17·0	26·0	17·5
Irritability (%)* ..	34·0	33·9	28·9	20·0
Dysmenorrhoea (%)* ..	43·3	49·0	44·4	47·5
Mean N	25·1	26·2	25·0	22·7
Mean E	25·4	22·9	24·6	25·7

* Includes moderate and severe.

per cent. of the sample) but there is no *a priori* reason to believe that they are atypical menstrually or in personality.

DISCUSSION

The prevalence of menstrual symptoms is very high. More than one woman in nine reports severe degrees of pain, of irritability or of headache in association with her periods, and one woman in sixteen reports that she gets very depressed or tense. Four out of five women are conscious of swelling of the body, one in fourteen restricts her activities during menstruation and one in seven has irregular periods. It is clear that only a fraction of these people bring these symptoms to their doctor, and that, of those who do, few are passed on to the gynaecologist or the psychiatrist. Naturally, therefore, the populations of these clinics are very selected. All these women reported severe degrees of symptoms, so it is unlikely that severity by itself is the most important reason for consulting a doctor or for being referred to hospital. We feel that the personality of the women concerned is likely to be a more important factor. Hence we are convinced that little idea of the personality characteristics of those with menstrual disorders can be learned from studying only hospital patients.

Certain symptoms, irritability, depression and tension, headache and body swelling cluster together in a temporal relationship. They all occur maximally one or more days before the period begins. We also find that these symptoms are all closely intercorrelated so that a woman who experiences one is likely to experience the others. They form a syndrome conforming closely with that described by Frank (1931), by Rees (1953a, b) and by Greene and Dalton (1953). Epidemiological support is thus given to clinical observation. In fact, the syndrome is far more widespread than has been believed hitherto, moderate or severe degrees of it occurring in about a quarter of all women. It seems as though a change takes place premenstrually which excites these symptoms in women prone to them.

The high prevalence of sensations of swelling

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in the breasts and abdomen premenstrually is of considerable interest although not readily explicable in the light of recent work (Bruce and Russell, 1962) which finds little evidence of water retention at this time. It is possible that these sensations are related to a redistribution of water and electrolytes between intra- and extracellular compartments of the body. It is of interest that such a redistribution is found in cases of severe depression (Coppen and Shaw, 1962), and perhaps the study of physiological changes in depression and menstruation may show factors in common, which in turn are related to the regulation of mood.

Swelling and the other psychological symptoms reported premenstrually cannot be dismissed simply as hypochondriacal or hysterical complaints in neurotic women, for if this were the explanation one would surely expect women with high neuroticism scores to complain of dysmenorrhoea as well, but they do not do so.

Irritability, depression and tension, to some extent headaches, and also swelling, are premenstrual phenomena significantly correlated with neuroticism. Dysmenorrhoea differs considerably. It is worst during menstruation, it is negatively correlated with age and parity and it is not associated with neuroticism.

Dysmenorrhoea is significantly correlated with the premenstrual syndrome, but here an interesting feature emerges. We compared the timing of dysmenorrhoea in women complaining of the premenstrual syndrome (taking irritability as the key symptom) with women without this symptom. Forty per cent. of those women with the premenstrual syndrome who also have dysmenorrhoea develop this symptom before, rather than during the period; only 22 per cent. of the rest of subjects with dysmenorrhoea develop it before the period. It seems, therefore, that one sort of period pain occurs premenstrually and can be regarded as an uncommon feature of the premenstrual syndrome, whilst the more usual sort is maximal during the period and is not part of the syndrome. Dysmenorrhoea is not correlated with neuroticism or extraversion. This survey provides no evidence to justify dysmenorrhoea being regarded as a psychosomatic condition or one that calls for psychological treatment.

Summary

A survey is reported on dysmenorrhoea and premenstrual symptoms and their relationship to neuroticism as measured by the Maudsley Personality Inventory. The findings are based on a sample of the general population.

The prevalence of these symptoms is reported and shown to be high.

Dysmenorrhoea showed no correlation with neuroticism and was negatively correlated with age and parity. In contrast, psychological symptoms such as irritability, depression and tension were found to be at their worst predominantly in the premenstrual period, and to be very significantly correlated with neuroticism. Headaches and sensations of swelling round about the menstrual period were also associated with neuroticism.

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