PSYCHOSOMATIC ASPECTS OF THE PREMENSTRUAL TENSION SYNDROME.

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A. INTRODUCTION.

THE term "premenstrual tension" was applied by Frank (1931) to a syndrome developing during the second half of the menstrual cycle and clearing up soon after the onset of the menses.

The syndrome consists of nervous tension, irritability, anxiety, depression, bloated feelings of abdomen, swelling of fingers and legs, tightness and itching of the skin, headaches, dizziness and palpitations. Less commonly there occur hypersomnia, excessive thirst and appetite, increased sex desire, and in some affected subjects an increased tendency for asthma, migraine, vasomotor rhinitis, urticaria and epilepsy.

The condition must not be confused with the premenstrual discomfort that many women experience without significant disability. The premenstrual tension syndrome may seriously interfere with work and social activities and can be incapacitating.

The aetiology of the condition remains obscure. A number of theories have been postulated implicating hormonal, physiological and biochemical changes, which will be discussed in more detail later.

A number of authors stress the importance of psychogenic factors. Hoffman (1944), reviewing the literature, concludes that an unstable nervous system may be the primary factor in the condition. The precise role of psychogenic factors in premenstrual tension has not yet been elucidated, and the present investigation was instituted with the aim of determining the relationship between the premenstrual tension state and neurosis, neurotic predisposition, personality type and general stability.

B. EXPERIMENTAL POPULATION.

The experimental population consists of a total of 145 patients comprising random samples of 61 normal women and 84 patients attending the Psychiatric Department of East Glamorgan Hospital and Psychosomatic and Allergy Clinics of St. David's Hospital, Cardiff. It was considered that such a group was likely to provide a wide variation in intensity of neurosis and emotional stability ranging from the normal stable person to the severely neurotic and maladjusted patient.

C. METHODOLOGY.

Data were collected, by interview, relating to menstrual history and symptomatology, family history, childhood neurosis, adjustment at school, work and marriage and personality assessed both in terms of general stability and clinical type. In the normal group the Maudsley Medical Questionnaire and Word Connection tests (Eysenck, 1947) were used as additional methods of detecting and assessing neurosis. Following assessment at clinical interview, patients were given a special chart for daily recording of a series of premenstrual symptoms and related items. Detailed instructions for guidance in the recording of data were given to each patient in order that the recording of symptoms might be reasonably standardized. The day-to-day records were made over a number of menstrual cycles, thus enabling a detailed assessment of premenstrual tension to be carried out.

The information was then entered on a special item sheet containing some 200 items for each patient. A number of features were rated according to severity on a 7-point scale, e.g., degree of premenstrual tension, existing neurosis, general adjustment, personality stability. Various other symptoms were graded on a three-point scale according to severity.

The information on the item sheets was finally transferred to Hollerith punched cards and analyses carried out by means of the Hollerith Counter Sorter.

D. FINDINGS.

Incidence of Premenstrual Tension.

(1) *Total group.*

In the total group of 145 subjects, 56·5 per cent. had no significant premenstrual tension symptoms, 24·8 per cent. had premenstrual tension symptoms of moderate intensity, and 15·6 per cent. had severe premenstrual tension states.

(2) *The Incidence of Various Grades of Premenstrual Tension in the Normal, Psychiatric and Psychosomatic Groups is as follows :*

	Normal. (%.)	Psychiatric and psychosomatic patients. (%.)	Statistical significance of difference. (%.)
No premenstrual tension	78·7	38	**
Moderate premenstrual tension	16·4	30	*
Severe premenstrual tension	5	32	**

The statistical significance of the differences of percentages was determined by the critical ratio. A critical ratio of 2 + is denoted by *one asterisk* and a critical ratio over 3 by *two asterisks*. This method of denoting statistical significance will also be employed in the remaining tables. Thus, if these groups can be regarded as random samples, there appears to be a higher incidence of premenstrual tension in psychiatric and psychosomatic patients than in normal women.

As there is no sharp dividing line between neurosis and normality, and as neurotic symptoms are often exaggerations of normal personality traits or attributes, it is desirable to attempt an assessment of the stability and degree of neurosis in the normal control group. This was carried out by clinical interview, and by means of the Maudsley Medical Questionnaire and Word Connection test. Data obtained on family history, childhood neurosis, personality type and stability indicated a low incidence of emotional instability, existing neurosis or evidence of neurotic predisposition. Similarly, testing with Maudsley Medical Questionnaire and Word Connection test revealed a low incidence of neurotic responses.

Comparison, within the normal group, of subjects with premenstrual tension with those free from premenstrual tension symptoms revealed no significant difference in incidence of personality instability or neurosis.

Thus premenstrual tension can exist in women with little or no evidence of instability in personality, maladjustment or of neurosis or predisposition to neurosis. Conversely, many women with severe neurosis do not suffer from premenstrual tension, e.g., in the group of 82 patients free from premenstrual tension symptoms 20 per cent. had a severe neurosis, 23 per cent. showed clear evidence of neurotic predisposition and 18 per cent. had very unstable personalities.

Thus neurosis or emotional instability in itself is not sufficient to account for the premenstrual tension syndrome.

(3) *Predisposition to Neurosis and the Premenstrual Tension Syndrome.*

Slater (1942) has considerably clarified the concept of the neurotic constitution. According to Slater's hypothesis, neurosis represents a special case of a generalized type of behaviour and signifies a failure of adaptation. The two primary reagents are the individual constitution and environmental set up of the moment. The former determines the form and severity of the neurosis, and the latter the time and to a lesser extent the severity of the symptoms.

The best indicators of the neurotic constitution are the following: clinically abnormal personality, neurosis in childhood, positive family history and poor work record. Data on these features are given in Table I for the total group subdivided as follows:

(1) 82 subjects with no significant premenstrual tension (ratings of 2 and less).
(2) 36 subjects with moderate premenstrual tension (ratings of 3 and 4).
(3) 27 subjects with severe premenstrual tension (ratings of 5 and over).

It will be seen from Table I that on the evidence of a history of childhood neurosis, personality stability and clinical abnormality, the patients with severe premenstrual tension have the most marked neurotic constitution.

On the basis of the criteria laid down by Slater (1942) each subject was rated on a 7-point scale according to evidence of severity of neurotic constitution. Taking ratings of 2 and less as mild, 3 and 4 as moderate and 5, 6 and 7 as severe degrees of neurotic constitution and comparing the grades with various degrees of premenstrual

TABLE I.

Family history.	Degree of premenstrual tension. *Nil.* (%.)	Moderate. (%.)	Severe. (%.)	Statistical significance of difference between group with severe and group with no premenstrual tension.
Negative	75·6	69·4	74	
Neurosis mild	14·6	11·1	7·4	
Neurosis severe	7·3	13·9	14·8	*
Psychosis	2·4	5·6	0	
Epilepsy	1·2	0	0	
Childhood neurosis.				
Nil	68	58·3	52	
Mild	6·1	5·6	0	
Moderate and severe	20·7	27·8	40·7	*
Personality.				
Stable	72	41·5	7·4	**
Somewhat	19·6	41·5	52	**
Very unstable	3·7	8·3	29·6	**
Meek, dependent, timorous.				
Not	73	47·1	11·1	**
Somewhat	17·1	25	33·3	
Very	7·3	19·4	52	**
Anxious.				
Not	63·4	22·2	3·7	**
Somewhat	13·4	22·2	14·8	
Very	22	52·6	81·5	**
Obsessional.				
Not	79·4	52·6	33·3	**
Somewhat	15·8	19·4	33·3	
Very	3·7	13·9	29·6	**
Hysterical.				
Not	88	88·7	55·5	**
Somewhat	4·9	5·6	29·6	**
Very	0	0	3·7	
Hypochondriacal.				
Nil	86·7	77·6	63	**
Moderate	7·3	16·6	25·9	
Severe	1·2	2·8	11·1	**

tension, the relationship between severity of premenstrual tension and the neurotic constitution shows up clearly (Table II).

It will be seen that there is a positive correlation between rating of neurotic constitution and rating of premenstrual tension. Thus it seems that the greater the predisposition to neurotic breakdown the greater the intensity of premenstrual tension symptoms.

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TABLE II.

Severity of premenstrual tension.	Degree of neurotic constitution. *Nil* or mild. (%.)	Moderate. (%.)	Severe. (%.)
Nil	76	17	7
Moderate	56	36	8
Severe	15**	48**	37**

(4) *Co-existing Neurosis and Severity of Premenstrual Tension.*

Table III gives the distribution of types of neurosis among the various grades of premenstrual tension.

TABLE III.

Degree of premenstrual tension.	Type of neurosis. None. (%.)	Anxiety state. (%.)	Depressive state. (%.)	Hysteria. (%.)
Nil	81	15	0	4
Moderate	69	25	3	3
Severe	30	59	4	7

Thus the severe premenstrual tension group has a higher incidence of neuroses than the group with no premenstrual tension.

TABLE IV.

Degree of premenstrual tension.	Degree of neurosis. *Nil* or mild.	Moderate.	Severe.
Nil	82	15	6·0
Moderate	97	3	0
Severe	22·2**	44·4**	33·3**

From Table IV it will be seen that there is a positive correlation between the severity of neurosis and the intensity of premenstrual tension symptoms. The more severe the neurosis the greater is the intensity of premenstrual tension symptoms. The differences between the severe premenstrual tension group and the group with no premenstrual tension are statistically significant.

It is interesting to note that the onset of premenstrual tension symptoms antedated the onset of neurosis in over 90 per cent. of cases.

(5) *General Stability and Adjustment in Relation to Severity of Premenstrual Tension.*

Each subject was assessed regarding her adjustment at school, work, or marriage. A composite rating of adjustment is based on these assessments and given in Table V.

TABLE V.

Degree of premenstrual tension.	Degree of maladjustment. *Nil* or mild (%.)	Moderate. (%.)	Severe. (%.)
Nil	92	8	0
Moderate	80	14	6
Severe	41	48**	11**

It will be seen that patients with a severe degree of premenstrual tension have a significantly higher incidence of moderate and severe degrees of maladjustment than the group with no premenstrual tension.

(6) *The Age Factor.*

The results, so far, are quite definite, but it is desirable to ascertain whether the differences found could be attributed to other factors such as age, particularly as the age distribution of the three groups differs as shown below :

Degree of premenstrual tension.	Age-groups. 15–24. (%.)	25–34. (%.)	35–44. (%.)	45+. (%.)
Nil	48·8	28	9·8	13·4
Moderate	25·0	30·6	27·8	16·6
Severe	7·5	29·6	29·6	33·3

The group with no premenstrual tension symptoms is younger in age distribution than the moderate and severe premenstrual tension groups.

We have, therefore, to consider the possibilities that premenstrual tension is more severe in older age-groups or that the incidence or severity of neurosis is greater in older people.

It is therefore necessary to control the age factor, and to ascertain whether the positive correlation between degree of premenstrual tension and degree of neurotic constitution, personality instability, maladjustment and co-existing neurosis still obtains.

An analysis was accordingly carried out on the three grades of premenstrual tension accurately matched for age. Each group consisted of 24 women and the results are given in Table VI.

TABLE VI.

Degree of premenstrual tension.	Neurotic constitution. Mild. (%.)	Moderate. (%.)	Severe. (%.)
Nil	62·4	16·7	20·8
Moderate	45·8	12·5	41·7
Severe	16·7	37·5	45·8*
	Personality instability.		
Nil	66·7	12·5	20·8
Moderate	45·8	12·5	41·7
Severe	20·8	25	54·2*
	Degree of maladjustment.		
Nil	79·2	0	20·8
Moderate	75	8·4	16·7
Severe	41·7	12·5	45·8*
	Co-existing neurosis.		
Nil	79·2	20·8	8·4
Moderate	58·4	8·4	33
Severe	20·8	37·5	41·7**

Thus the correlation between degree of premenstrual tension and neurotic constitution, instability, maladjustment and degree of co-existing neurosis still holds good and cannot be attributable to the age factor.

(7) *Symptomatology.*

The onset of premenstrual tension symptoms varies from 2–12 days before the period. Over two-thirds begin having symptoms 6–12 days before the menses. In the majority of patients the symptoms pass off soon after the onset of menstruation, but some 15 to 18 per cent. continue to have symptoms throughout the period.

The following is the incidence of various symptoms in our group : General tension and irritability 100 per cent., depression 80 per cent., anxiety 77 per cent., swelling of fingers or legs 74 per cent., painful swelling of breasts 66 per cent., insomnia 40 per cent., fatigue 66 per cent., headaches 66 per cent., palpitations 40 per cent., nausea or vomiting 33 per cent., pruritus 33 per cent., dizziness 25 per cent., marked thirst 20 per cent.

Some patients reported increased appetite, especially for sweet things, and others increased sex desire. In patients subject to such conditions an increased tendency to asthma, vasomotor rhinitis, angioneurotic oedema and migraine was noted.

(8) *Age of Onset of Premenstrual Tension.*

Degree of premenstrual tension	Age-groups. 15–24 yrs.	25–34 yrs.	35–44 yrs.	45+
Moderate	58·3	27.8	8·3	4·6
Severe	59·2	14·8	14·8	11·1

Nearly 60 per cent. of patients with premenstrual tension started during the age range 15–25 years and nearly 80 per cent. before the age of 35. In the majority of patients premenstrual tension occurred before marriage. Of the married women 50 per cent. had no children, but in some patients with children it was found that premenstrual tension had developed or had become worse after childbirth. A small proportion of patients develop premenstrual tension for the first time just before the onset of the menopause.

(9) *Menstrual Data.*

Menarchial age.—It will be of interest to compare the menarchial age of women who suffer from premenstrual tension with those who do not.

Age at menarche.	Degree of premenstraul tension. *Nil.*		Moderate.		Severe.	
9–10	1·2	35·7%	0	15·7%	0	3·7%
11–12	34·5		15·7		3·7	
13–14	43·8		41·6		40·7	
15–16	14·6	15·8%	27·7	33·3%	29·6	37·2%
17	1·2		5·6		7·6	

It will be observed that patients with moderate and severe degrees of premenstrual tension have a higher incidence of persons with later menarchial ages than those with no premenstrual tension.

Average duration of menses.—It was found that cycles were very rarely constant both regarding length of menses and the duration of the cycle.

37 per cent. of patients with severe premenstural tension had menses lasting on an average more than 7 days compared with 16 per cent. in the moderate premenstrual tension group and 18 per cent. in the group with no premenstrual tension.

E. Discussion.

Our findings indicate that severe premenstrual tension symptoms can occur in normal women with little or no evidence of neuroses or neurotic predisposition. If the groups can be accepted as random samples it appears that premenstrual tension however, is more frequent among neurotic subjects. Furthermore, there is a positive correlation between the intensity of premenstrual tension symptoms and severity of neurosis, general instability and neurotic predisposition.

Thus while marked premenstrual tension syndrome can occur in the absence of neurosis or personality instability, when these conditions co-exist they are positively correlated.

The condition cannot be dismissed as being neurotic or primarily psychogenic. There are many severely neurotic women with no significant premenstrual tension. In the patients with severe premenstrual tension and also a neurosis, the onset of premenstrual tension antedated the onset of neurosis in all patients except one. Many patients with neuroses responded to psychiatric therapy without significant improvement in the premenstrual tension state, and it was possible to eliminate premenstrual tension symptoms by pharmacological methods to be described without significantly affecting the co-existing neurosis.

It is not considered that conscious anticipation of the menses was an important factor. As a rule women have already developed premenstrual symptoms without

realizing the relationship with phases of the menstrual cycle. Deutsche (1947) considered premenstrual tension to be due to an unconscious perception of the approaching menses. Even if unconscious perception is not self contradictory such statements are as difficult to accept as to refute.

In order to consider the premenstrual tension syndrome fully it is necessary to consider psychological aspects of the menstrual cycle along with biochemical, endocrine and physiological changes.

Psychological Aspects.

(a) *Social-cultural Influences.*

From ancient times menstruation has been a subject of taboos. Frazer in *The Golden Bough* describes a large number of prohibitions and restrictions placed on the menstruating women. Rosenzweig (1943) considers that many of the restrictions applied to-day in our society on the menstruating women, e.g., prohibition of bathing, is a survival of earlier superstitions. Even nowadays men often regard menstruating women as being disgusting or contagious or in other ways dangerous or harmful, and women themselves have special attitudes to menses relating to anxiety and superstition. Such social cultural influences, although important determinants of attitudes to menses, do not explain why some patients develop premenstrual tension and other equally sensitive, susceptible and unstable individuals remain free from the syndrome.

(b) *Personal Attitudes.*

Personal attitudes to the menses differ widely. This is shown by the variety of names given by different women to the menses.

A woman's attitude to her menses will be influenced by a large number of factors.

The way a girl is prepared for her first period may have an important influence on her future attitude to menstruation. Deutsche (1947) believes that the attitude of the girl to her mother is often the determining factor in the emotional response to her menses. Some will display hostility and aggression for not being adequately prepared for the first period, while others will make an excellent adjustment if their mothers show understanding and gentleness at the time.

The appearance of the first period was described as a severely emotionally upsetting experience in 25 per cent. of the severe premenstrual tension patients, compared with 8·3 per cent. in the moderate premenstrual tension group and 10 per cent. in the group with no premenstrual tension. It is difficult to know what significance to attach to this, as it is possible that patients with severe menstrual disturbances would tend to remember emotional upsets at the menarche more readily than patients free from such symptoms. It is interesting to note that 12 per cent. of the normal group stated that the menarche was an emotionally disturbing experience.

Menstruation is experienced as evidence of the difference between the sexes and as indicating her future function of pregnancy and childbirth. Thus a woman's attitude to the feminine role and also to child-bearing may influence her attitude to her periods.

(c) *Fluctuations in Emotions, Activity and Interests during the Menstrual Cycle.*

Jacobi (1877) propounded the menstrual wave theory, and described menstrual symptoms as a cyclical ebb and flow of somatic functions.

Havelock Ellis (1930) quotes the work of Ott (1890) and Engleman (1900), who reported cyclical changes with a maximum excitability about 3 days before the onset of the menses.

McCance *et al.* (1937), in a careful statistical study of day-to-day records in normal women, noted a tendency for depression to occur just before and during the early stages of the period but not an overwhelming incidence as suggested in the literature. There was a tendency for depression, elation, pain, fatigue and sexual feeling to be low in incidence around the 2nd to 23rd day. They describe the week before the periods in this normal group as a dull and unemotional period. This is the antithesis of the severe premenstrual tension state, and the findings of McCance and co-workers indicate the premenstrual tension state as not likely to be an exaggeration of normal changes at this time.

Altman *et al.* (1941), however, reports from a detailed study of 10 normal subjects that there was a tendency for an outburst of physical and mental energy before the onset of menstruation, coupled with high tension and irritability and preceded or accompanied by depression. During the ovulation phase there was a tendency for increased activity and elation free from tension.

Benedek and Rubenstein (1939) carried out a detailed psychoanalytic study of a small series of neurotic women in which the psychological findings were correlated with data on vaginal smears and basal body temperatures.

They found that oestrogen production was paralleled by active sexual energy which dominates behaviour. Progesterone production was found to be correlated with a passive direction of psychosexual energy, calmness and passive receptive tendencies.

These interesting findings of Benedek and Rubenstein would appear to be in agreement with the hypothesis that the premenstrual tension state is due to the action of unantagonized oestrogens, and accounts for the absence of a " quiet phase " before menstruation in patients with the premenstrual tension syndrome.

Biochemical Changes.

1. *Salt and Water Metabolism.*

A number of clinical reports have mentioned a tendency to water retention during the premenstrual phase. Thorn (1938) found retention of sodium and water premenstrually. Thomas (1933) described two patients with massive generalized oedema amounting to 12–18 lb. in the premenstrual period. Greenhill and Freed (1941) postulated that sodium and water retention, giving rise to an increase in extracellular fluid in various parts of the body, was the immediate cause of premenstrual tension symptoms.

Sodium retention according to Thorn (1938) is due to the action of ovarian steroids. Morton (1950) in a careful study of 29 patients with premenstrual tension found hydration to be a feature of the premenstrual phase. He found in two surgical castrates and menopausal women with no evidence of significant oestrogen activity that large doses of oestrogen produced a gain in weight and increased nervous tension.

2. *Carbohydrate Metabolism.*

Increased sugar tolerance was noted by Morton (1950) in nearly two-thirds of his premenstrual tension patients. The glucose-tolerance curves were low and plateau-shaped. This increased sugar tolerance tends to result in hypoglycaemia. The feelings of fatigue as well as increased appetite which occur in some patients during the premenstrual period is considered by Morton to be due to hypoglycaemia. Billing *et al.* (1947) also report a definite increased sugar tolerance immediately prior to the menses, with marked flattening of the sugar tolerance curve in patients with premenstrual tension.

3. *Endocrine Changes.*

The periodic changes occurring in the endometrium from menarche to the menopause consist of growth, secretion, shrinkage and shedding. The crucial event of the menstrual cycle is ovulation (Bishop, 1950) ; on it depends not only the release of the ovum but the formation of the corpus luteum and the secretion of progesterone. Before ovulation the endometrium is solely under the influence of oestrogen which stimulates growth and proliferation. After ovulation the combined effect of oestrogen and progesterone leads to changes which are a prelude to pregnancy. Normal menstruation is due to diminished secretion of both oestrogen and progesterone. Follicle-stimulating hormone (FSH) of the pituitary controls the development of the Graffian follicle in the early days of the cycle. The production of luteinizing hormone (LH) later increases and ovulation is probably due to the fall of FSH and when the rise of LH reaches a certain point. A third gonadotrophic hormone, luteotrophin, maintains corpus luteum for about two weeks and causes release from it of progesterone.

Frank (1931) thought that premenstrual tension was due to a high level of circulating oestrogen brought about by a high renal oestrogen threshold. Israel (1938) thought that premenstrual tension was due to the action of unantagonized

oestrogen, and that the primary fault was lack of progesterone secretion due to faulty luteinization.

Gillman (1942), however, found that progesterone in doses of 10–30 mgm. given for 8–12 days of the cycle produced symptoms of premenstrual tension.

Morton (1950) studied 29 patients with premenstrual tension by means of daily basal temperature, endometrial biopsy, vaginal smears and urinary hormone assays. His findings indicated a decreased or absent secretion of progesterone which permitted an uninhibited rise of oestrogen in the premenstrual phase in patients suffering from premenstrual tension. The theory of premenstrual tension being due to high levels of oestrogen in the premenstrual phase is also supported by Greenhill and Freed (1945).

Thus the general weight of evidence appears to be in favour of the hypothesis that premenstrual tension state is associated with low progesterone and high level of unantagonized oestrogens.

4. *Cardiovascular Changes.*

Brewer (1938) maintained that premenstrual tension was due to increased capillary permeability, but Reynolds *et al.* (1941) were not able to observe any cyclical changes in capillaries during the menstrual cycle.

5. *Autonomic Nervous System Changes.*

Symptoms of autonomic activity are characterictic of premenstrual tension. Evidence of both sympathetic and parasympathetic overactivity may be found, e.g., tachycardia and palpitations, as evidence of sympathetic overactivity and vomiting, urinary frequency, asthma and vasomotor rhinitis as signs of parasympathetic activity. Forda and Wolf (1944) found that oestrogens increase synthesis of acetylcholine whereas androgens, progesterone and adrenocortical hormone decrease its synthesis.

Acetylcholine is known to mediate transmission of impulses at parasympathetic nerve-endings and at all ganglia of autonomic nervous system. This effect may explain the autonomic lability of the premenstrual tension syndrome.

6. *Comparison of Premenstrual Tension Syndrome with General Adaption Syndrome.*

Selye (1950) postulates that, in addition to many specific defence mechanisms, there is an integrated syndrome of closely interrelated adaptive reactions to non-specific stress itself. This has been termed the general adaption syndrome which develops in three stages :

(1) Alarm reaction (AR).
(2) Stage of resistance (SR).
(3) Stage of exhaustion (SE).

Most of the characteristic changes in the AR disappear in SR and reappear on SE. The AR has a phase of shock characterized by tissue catabolism, hypoglycaemia and other features shown in the table below, which gives comparison with changes in premenstrual tension scale.

Phase of shock of alarm reaction.	Premenstrual tension.
Oedema	+
Urine output diminished	+
Haemoconcentration	+
Hypothermia	+
Hypotension	+
Hypochloraemia	+
Hyperkalaemia	+
Transitory rise in blood sugar	
Later fall in blood sugar	+

Selye (1951) finds that oestrogens can produce typical G.A.S. manifestations in experimental animals. Oestrogens have water-retaining properties, whereas progesterone and testosterone have diuretic properties (Selye, 1951). There is thus a general similarity between the stage of shock of the G.A.S. and the premenstrual

tension state. Selye's work on the physiological and biochemical changes in the alarm reaction, particularly his finding that oestrogens produce such reactions, in contrast to progestogens and testosterone, is in keeping with our findings on the clinical features and results of treatment of the premenstrual tension state. The alarm reaction according to Selye can also be evoked by emotions, which may therefore also contribute to the above changes found in the premenstrual tension state.

Results of Treatment.

Observations carried out on the effect of various methods of treating the premenstrual tension syndrome provide us with important clues on its aetiology.

Rees (1952) describes results obtained by treating a group of women with severe premenstrual tension states by various methods.

It was found that the condition was not amenable to psychotherapy alone. Psychotherapy was useful in helping the patient to understand the nature of the condition, and helping to modify her attitude and reaction to it in order to reduce the degree of disability incurred.

Dehydration therapy by means of ammonium chloride administration with limitation of sodium intake successfully prevented the increase of weight, swelling of subcutaneous tissues and various symptoms attributable to hydration, or removed them if they had already developed. Dehydration therapy, however, did not always remove the symptoms of tension and irritability, and it was considered that hydration did not account for all the symptoms of the premenstrual tension syndrome.

Progesterone by injection and ethisterone by mouth were effective in preventing or relieving hydration and the various symptoms of premenstrual tension state. Testosterone was also found to be effective. It was pointed out that progesterone, ethisterone and testosterone were diuretic and antagonistic in action to oestrogens, and that this appeared to be a possible explanation for their therapeutic efficacy.

Synthesis and Formulation.

The premenstrual tension syndrome is a complex psychophysical state determined by a multiplicity of factors.

Starting peripherally we have the following changes associated with the premenstrual tension state :

(1) *Tissue changes.*

- (*a*) General : Hydration giving rise to swelling of subcutaneous tissues of fingers, feet, legs and other parts of the body and hydration of various organs. This accounts for increase in weight, tight feelings in skin, heavy feelings in head, bloated feelings in abdomen and pruritus.
- (*b*) Specific : Proliferation of epithelia of breast, vagina and endometrium.

(2) *Changes in blood composition.*—Tendency to haemoconcentration, hypoglycaemia, increased insulin secretion and increased sugar tolerance.

(3) *Cardiovascular changes.*—Cardiovascular lability and according to some authors increased capillary permeability.

(4) *Hormonal.*—Probably imbalance of oestrogen and progesterone due to deficient or absent progesterone secretion permitting action of unantagonized oestrogens. Changes in pituitary-adrenocortical functions.

(5) Nervous system changes including generalized increased excitability and autonomic disequilibrium. The autonomic disequilibrium may be partly attributable to evocation of homeostatic mechanisms by the above changes, and may also be due to changes in acetylcholine production attributable to oestrogens.

These bodily changes are responsible for the majority of the symptoms and signs of the syndrome. The patient may react to these changes in the internal environment in different ways and her reaction will be influenced by—

(1) Constitutional factors, e.g.,

- (*a*) Stability of the autonomic nervous system and homeostatic mechanisms.
- (*b*) Personality type.

(2) Degree of general stability, i.e., her ability to cope and adjust to changes in the internal environment and stresses in the external environment. This stability will be reflected in—

(*a*) General adjustment during life, to family, school, work and marriage.
(*b*) Personality reactions and social interaction.
(*c*) Incidence of neurotic and psychosomatic disorders.

There are thus two main components of the premenstrual tension syndrome.

(1) The characteristic bodily changes.
(2) The reaction of the person to such changes.

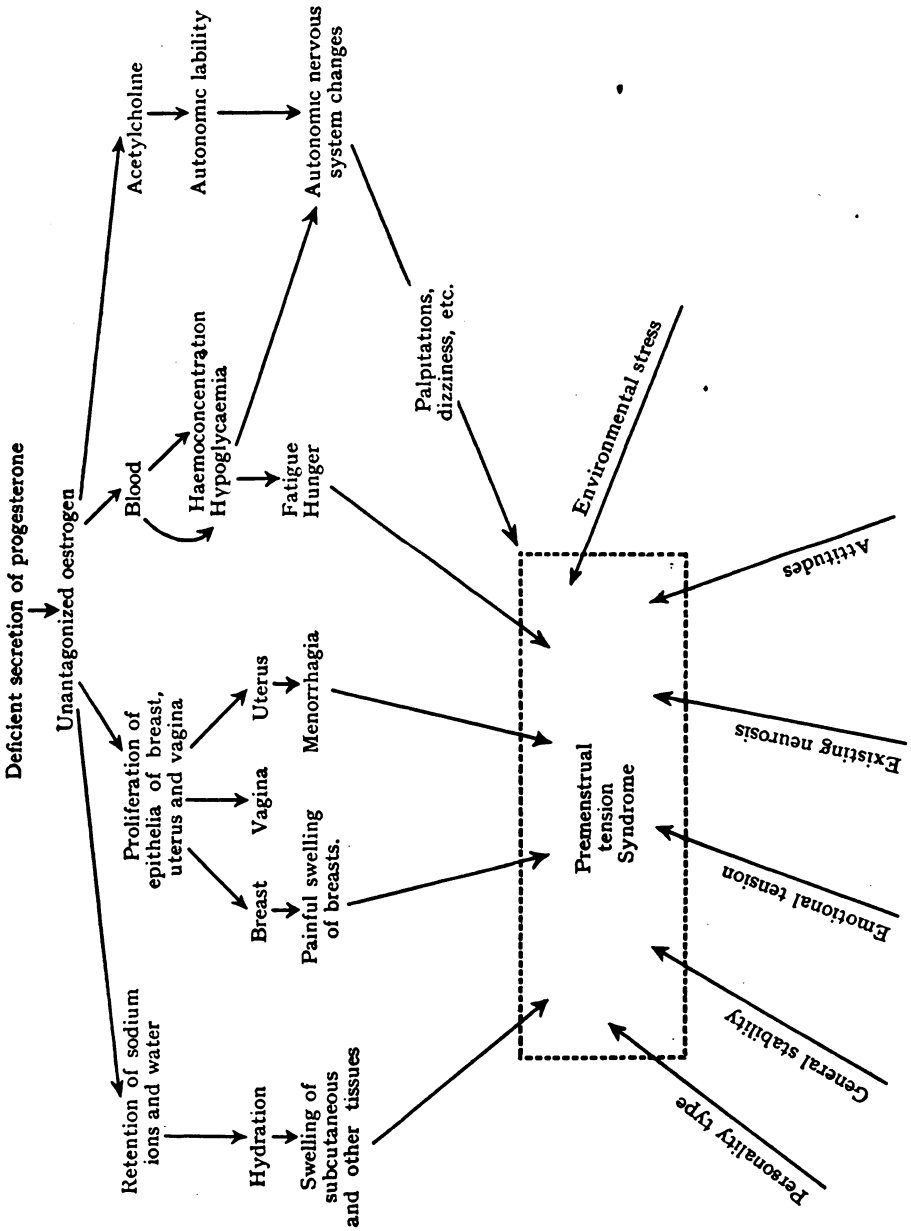

FIG. 1.—Schematic presentation of a working hypothesis of the premenstrual tension syndrome.

Our observations suggest bodily changes to be the primary factor in the syndrome.

The intensity of bodily changes will vary according to the degree of hormonal imbalance. Thus if the hypothesis of progesterone lack is verified, there could be a possible variation from a slight decrease of progesterone secretion to a complete absence. Progesterone lack would be more marked in some women than others and the resulting bodily changes would tend to be greater, the degree being also determined by the efficiency of the body's homeostatic mechanisms. Thus if the hormonal and other bodily changes described are marked it is possible to get premenstrual tension symptoms in women who are otherwise quite stable.

In unstable or neurotic women the intensity of symptoms and the degree of disability may be influenced in psychogenic factors as well as the above-mentioned physiogenic processes. Co-existent emotional tension, certain attitudes, environmental stress may also serve to accentuate premenstrual tension symptoms. A schematic representation of the syndrome is given in Fig. 1.

Treatment can be applied at various aetiological levels. Psychotherapy in the form of explanation and re-education can help, and dehydration therapy or treatment by means of progestogens or androgens can relieve the various bodily symptoms and signs of the premenstrual tension syndrome.

The syndrome should always be regarded and treated as a manifestation of the patient's total personality functioning as a psychosomatic unity.

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