MENSTRUATION IN RELATION TO MENTAL DISORDERS.*

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In July, 1927, at a British Medical Association meeting, in the Obstetrics and Gynæcology Section, G. I. Strachan (16) dealt with the mental side of the hygiene of menstruation. He made the statements that in cases where menstruation was influenced in mental disease it was usually in the direction of excess, and moreover he had found no justification for the text-book statement that insanity was usually accompanied by amenorrhœa. A study of the more important text-books of psychiatry reveals a paucity of information on the subject, and this has stimulated me to collect any facts which have bearing on this interesting problem.

Menstruation may be defined as a periodic change occurring in the human female during the course of adult sexual life, with hæmorrhage as the well-known external manifestation. It has been generally agreed that there is a fluctuation in the whole female economy. Eden and Lockyer (5) state that the pulse-rate, temperature, blood-pressure and urea excretion are raised above normal in the pre-menstrual period, fall below normal at the period of flow and rise to normal during the resting period. Central nervous system disturbances such as headache, backache, excitement or depression are also known to occur.

The only evidence I can find in opposition to these facts is the result of research carried on at the London School of Medicine for Women, under the direction of Prof. W. Cullis (3). There was said to be no change during menstruation in basal metabolism, pulse-rate or blood-pressure, and that the cost to the organism of a certain amount of work and the recovery-rate from work was the same both during menstruation and the inter-menstrual interval.

A study of literature shows that from time immemorial there has existed a taboo concerning the menstruating woman, and in Leviticus, chapter xv, verse 19, is found the Mosaic expression of this tribal ruling. It is known that most ancient customs contain

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at least a grain of truth, and so that this Biblical injunction, too, has some scientific basis. Macht and Lobin (10) claim to have demonstrated the presence of a toxic substance called menotoxin in the blood, milk, saliva and perspiration of menstruating women. This menotoxin has been shown to have a chemical relation to oxy-cholesterol.

In conformity with this statement it is of interest to review recorded cases of variation in pathological processes coincident with menstruation.

Trentini (18) noted pre-menstrual rises of temperature in tubercular women. Increase in intensity of episcleritis at the pre-menstrual period was shown by Ombrain (13). Neulen (12) recorded retinal hæmorrhage synchronous with the onset of the menstrual period. A form of dermatitis associated with dysmenorrhœa was described by Tragant (17). Aschner (1) suggested that vasomotor and nervous disturbances were caused by retention of toxin in cases of irregular menstruation. Carloni and Ferrari (2), in an investigation of eclampsia, found that the highest percentage of eclamptic cases occurs in subjects with irregular menstruation.

A considerable amount of evidence is thus presented in favour of the view that menstruation may be a period of stress.

Blair Bell has shown that the calcium content of the blood-serum is considerably raised above normal in the pre-menstrual phase, falls rapidly during the period of hæmorrhage, and that the menstrual blood contains a high percentage of calcium salts.

Much work has been done by Collip and others to show that calcium metabolism is bound up with parathyroid functioning, and there is an intimate relation between the calcium in the body and the working of the vegetative nervous system.

The changes which are proved to occur in the premenstrual phase can now be aggregated as a sympathicotonia, and in the menstrual period as a vagotonia. These well-known syndromes have been described in detail by Eppinger and Hess, and I would submit that herein lies the explanation of the variation in mental state exhibited by a large percentage of women at the menstrual epochs.

At this point it is interesting to remember Langdon Brown's (9) conception of a "basic tripod" consisting of (1) gonads, (2) endocrines and (3) vegetative nervous system, and to this combination is entrusted both the preservation of the individual and the continuity of the species.

Such degenerative changes in the gonads as have been described by the late Sir Frederick Mott and the late Dr. Laura Foster can be seen to affect the equilibrium of this "tripod," and thus form the basis of the bodily changes seen in the primary dementias. The

proper functioning of the gonads in females is reflected in a normal menstrual process, and thus abnormalities in menstruation will be expected in psychotic patients.

This physiological and pathological explanation seems more reasonable than the psychological reason given by W. H. B. Stoddart (15). He states that the exacerbation of mental symptoms at menstruation is due to the sexual instinct being strongest at this period, and so tending to escape repression.

The following is a *résumé* of the menstrual histories in 243 patients with psychoses of some duration.

At present I am unable to give figures bearing on the relation between menstruation and the onset of insanity, and between menstruation and recovery. These are still being collected.

Patients examined	474
,, beyond menopausal age	231
,, at menstrual age	243
Number showing increase of depression	41=16·8%
,, ,, ,, excitement	120=49%
,, ,, no change	49=20%
,, ,, amenorrhœa	33=14·2%
,, ,, dysmenorrhœa	49=20%
,, ,, menorrhagia	29=12%

Conclusions.

It is thus seen that increase of excitement is the commonest change, occurring in about half the cases.

In established cases of psychosis, amenorrhœa occurs roughly in 1 in 7 cases, while dysmenorrhœa reaches the high proportion of 1 in 5 cases.

Menorrhagia occurs in 12% of the cases, which would seem a lower estimate than that of G. I. Strachan (16).

Epilepsy.

This subject seems to deserve a special and separate consideration. Many writers, including such authorities as Gowers (7) and Turner (19), have appreciated the fact that epilepsy is influenced by menstruation.

The statistics of this disorder show marked increase in the female cases in the second and third decades of life at the time when the menstrual function is in evidence. Epilepsy may begin with the first menstrual period, and in certain cases may cease at the climacteric. Cases are recorded where fits occurred at irregular intervals,

to be grouped at the pre-menstrual period or at the onset of menstruation. There are some cases in which the attacks are confined entirely to the pre-menstrual or menstrual periods, and these may be rightly designated " menstrual epilepsy." Migraine, which is probably an allied condition, is known to show a tendency to occur exclusively at the pre-menstrual period. This was pointed out by Fordyce (6) 150 years ago, and quoted recently by A. F. Hurst (8).

There has been much speculation as to the cause of this association. Muskens (11) has suggested variation in endocrine activity at this epoch. Yet he dismisses in a few lines the possible connection between the gonads and the menstrual periodicity of epilepsy, and refers contemptuously in a foot-note to the treatment of a possible case of " menstrual epilepsy " by double ovariectomy.

My interest in this problem was aroused in 1922, when I was privileged to see a case of " menstrual epilepsy " treated by Mr. Beckwith Whitehouse. He performed double ovariectomy and hysterectomy on this case and the patient has been free from fits since the operation. One other similar case was operated on in the same way, and except for a few fits in the early months following the operation, has been free from attacks.

(I am indebted to Mr. Beckwith Whitehouse for permission to mention these cases, which have not previously been published.)

The latest views on epilepsy incline to a metabolic explanation of the disease, as is well expounded by Collier (4) in his recent Lumleian Lectures. Much biochemical investigation has been carried out, to elucidate the cause of epileptic attacks.

Okey, in 1925, pointed out that at the pre-menstrual period, when fits are often most frequent, blood cholesterol is markedly decreased. Popea and Vicol in the same year concluded that this lowering of cholesterol in the blood was the result, and not the cause of the epilepsy. In 1927, Robinson, Russell Brain and Kay (14) satisfactorily proved that the fall in blood cholesterol was not the result of the fits and gave figures for 100 cases.

The metabolism of cholesterol is at present little understood. Cholesterol is known to occur in the white matter of the brain, in the corpora lutea, in envelopes of red cells, and in bile. The liver is known to play some part in its metabolism. It is thus interesting to note that the ratio of brain weight to liver weight is greater in epileptics than in normals, as was shown by Thom in 1916.

Macht and Lobin's (10) demonstration that menotoxin is chemically allied to oxy-cholesterol may now be connected with the low blood cholesterol at the menstrual period and at the time of onset of a major proportion of the epileptic attacks.

Further biochemical investigation in this direction would seem

to offer some hope of a solution of the problem of epilepsy, about which so much has been written and yet so little of causation definitely known.

Epileptics Examined.

Total		73
At menstrual age		53
Cases showing fits at menstrual periods only		5
,, ,,	increased fit-incidence at menstrual periods	40
,, ,,	dysmenorrhœa	22
,, ,,	marked bodily disturbance, *e.g.*, rise of temperature, vomiting, etc.	3
,, ,,	menorrhagia	4

Of menopausal age: Showing cessation of fits at menopause, 3; showing continuance of fits, 17.

Conclusions.

It is seen that a high percentage show the pre-menstrual or menstrual grouping of the fits and that dysmenorrhœa is very common amongst the epileptics.

The continuance of the fits beyond the menopause may be due to the formation of the fit habit, over-ruling the endocrine change.

I am indebted to the Medical Superintendent for permission to publish the statistics included in this paper.

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