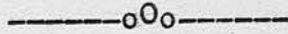


ECLAMPSIA.



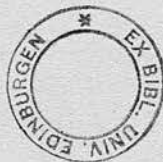
THESIS SUBMITTED FOR THE

M.D. EDINBURGH

BY

ALICE BARBARA ~~STUART~~ SMITH

M.B., Ch.B., 1920,
D.P.H., DUBLIN, 1922.



SECTION I

INTRODUCTION.

Eclampsia is a disease about which much has been written, and on which many careful observations have been made. The multiplicity of theories regarding its origin, the dramatic suddenness of its onset, the elusiveness of its etiology, the uncertainty of its prognosis and the variety of measures advocated for its prevention and cure, all cause it to be a disease of peculiar interest to the obstetrician.

In the face of all that has been published about Eclampsia it would be vain indeed for me to attempt to approach the subject from any new standpoint, or to claim to bring forward anything original from the scientific point of view. Nevertheless, some observations on the disease as it affects the native women of Southern India may be of use in substantiating or contrariwise, in disproving the tenets held by present day medical practitioners.

The native women of India are by no means exempt from attacks of this all important disease. Indeed, in South India at certain seasons of the year it is extremely prevalent.

Though in essential details it runs a course similar to that described in any text book, yet the special conditions, hygienic or otherwise which

(2)

prevail in a tropical environment cause it to be subject to certain modifications, dependant to some extent upon caste, creed, diet and climate.

Circumstances are such that the women for the most part lead a sedentary life, dominated largely by the almanac; normal spontaneous action is limited by superstitions and customs, often crude and absurd. In addition, the custom of child marriage and subsequent consummation of the marriage as soon as the girl attains puberty, in many instances, shuts her off from the normal freedom of girlhood and brings her to face the trials and dangers of motherhood at a time when growth and development are imperfect.

For these reasons I decided that it might be of value to investigate a series of cases for the purpose of trying to determine how far these various factors affect the incidence, course, prognosis and treatment of the disease, and have therefore chosen to make as the subject of this paper "Eclampsia amongst the natives of Southern India."

A series of 20 consecutive cases of Eclampsia will be discussed in the following pages and several additional cases will be referred to, where they would seem to illustrate points of special interest.

The majority of the patients were brought to

(3)

hospital by relatives when the manifestations of the disease had become so severe as thoroughly to alarm them; some were admitted on the recommendation of general practitioners, a few developed the disease after admission.

Many castes, both high and low are represented and their creeds include Christian, Hindu and Mohomedan.

amongst the maternity cases in this hospital

1 The proportion represented by the various groups is as follows:-

Christian	16.4%
Brahmin Hindu	20.3%
Non-brahmin Hindu	60.1%
Mohomedan	3.2%

Members of the Parsee and Jain community form a negligible proportion.

Diseases due to pregnancy are more largely responsible for the maternal mortality, than are obstetrical complications and abnormalities, and general intelligence, education and a [↑]full life do much to ward off diseases of pregnancy amongst the Indian women.

Amongst many interesting points brought out at the Congress held recently under the auspices of the "Far Eastern Association of Tropical Medicine," held in Calcutta, was that of the high ratio which obtains in all diseases of pregnancy amongst the

(4)

Mohammedan section of the community, irrespective of the area of the country in which they are domiciled.

The statistics given for eclampsia as far as these were available for the whole of India were:-

Mohammedan	2.54%
Hindu	0.95%
Others (chiefly Christian)	0.53%

On analysing my own cases in a somewhat similar manner, I found that the ratio of eclampsia in the following groups was:-

Mohammedans	20%
Non-Brahmin Hindus	8.6%
Brahmins	3.2%
Christians	no case.

The Mohammedan women are undoubtedly the most backward and unprogressive members of the community.

They go out very little and most of them observe the purdah system. The Christians, and, next to them the Brahmins, are much more advanced, many of them having had some education.

Thus it appears that the influence of social conditions on maternal conditions is not negligible at all events in Southern India.

The hospital into which the patients were admitted is a general hospital for women and children. It contains 75 beds for women, and of these beds about 18 are utilised for maternity work.

The patients were studied clinically during pregnancy, labour or the puerperium and points of

(5)

interest in their history were elicited by means of questions put to the patient or her friends.

Only simple laboratory methods could be employed.

SECTION II

"NUMBER OF BIRTHS, AGE, PLURAL PREGNANCIES:
RECURRENCE OF ECLAMPSIA IN THE SAME SUBJECT."

It has long been recognised that eclampsia is largely a disease of primiparity, very young primiparae in particular being liable to develop it. Some authorities state the incidence amongst them to be 70%, others 80%.

Of the above mentioned cases 85% were primiparae whose ages varied from 14 to 25 years, the average age being 18 years 8 months. In our hospital the average age at which the first labour takes place is 20.006 years, 78% being below 20 years of age. This is a higher figure than obtains throughout India generally. The recent figure given for the latter was 18.7 years.

The ages of the multiparae varied from 19 to 26 years, the average age being $21\frac{1}{2}$ yrs.

The reason for this preponderance amongst primiparae is not far to seek when we consider that the physiological functions of the excretory organs of the body are put to a severe strain at a period when their development is as yet imperfect. It is hard for the immature organs to supply the increased demands called for in pregnancy, and consequently a purely physiological process may become converted

into a pathological event.

When we take into consideration the fact that in India the majority of first pregnancies take place at an age earlier than that usual in most European countries, it need occasion little surprise to find a relatively high incidence amongst the primiparae of South India.

For somewhat similar reasons multiple pregnancy is frequently complicated by eclampsia.

In our hospital the incidence of twins is 1 in 46 of the total number of labour cases admitted. In 50 consecutive cases of eclampsia 2 cases were associated with twin pregnancy; this high incidence is however, probably merely a coincidence as records of previous years show only occasional cases of eclampsia associated with multiple pregnancy.

As both cases occurred in multiparae, one is led to presume that the metabolic demands in such cases are too great for even mature organs to answer easily. Cases of recurrence of eclampsia in the same subject have been reported from time to time, but no convincing case as such, has as yet come to my notice.

On many occasions I have watched the normal confinement of a patient who in a previous pregnancy had suffered from eclampsia, and who in subsequent pregnancies showed no signs whatever of the previous trouble.

As the question of recurrence is of considerable interest, it may be worth while here to describe one or two cases in detail.

Of these, one was a primipara, aged 19 years, belonging to the ~~M~~udliar caste. Though the women of this caste are not actually purdah, they are carefully guarded and their activities restricted. Many are vegetarians and early marriage is common amongst them. The men belong largely to the commercial sphere of life.

The patient was admitted when about 3 weeks off full term, with eclamptic fits. The urine was scanty, it contained blood and casts and was loaded with albumen. The patient complained of severe headache, though the blood pressure was never high, the diastolic pressure was proportionately more raised than the systolic. The patient had 3 fits altogether and she responded readily to treatment. When labour set in 2 days later, she was passing over 30 ounces of urine, in which the only abnormal constituent was a trace of albumen. The infant was small and though born alive died shortly after birth. When the patient was discharged from hospital on the 15th day she was well, though the urine still contained a trace of albumen. Ten and a half months later, she was

(9)

readmitted in labour, which terminated in the birth of a small but healthy infant. The labour was normal in every respect and the urine did not at any time show even a trace of albumen - this, in spite of the fact that the 2nd pregnancy followed so rapidly on the top of the first.

In contrast to the above was a Mohomedan patient aged 35 years. She was admitted in the 37th week of her 11th pregnancy, with a history of having suffered from eclampsia in her 9th pregnancy. On admission, she exhibited all the signs and symptoms of the so called "pre-eclamptic state." Mohomedan women on the whole observe strict purdah, they are backward, illiterate and shy; they eat largely and exercise little, and incline to be stout and flabby. The majority of the men belong to the merchant class, though their representatives are to be found in nearly every profession and trade.

This patient when admitted was very oedematous and she passed only a few ounces of urine, albumen loaded, in the first 24 hours. She had severe headache and the blood pressure was high, the systolic being 180 m.m. Hg, and the diastolic 130 m.m. Hg. She was given the routine treatment for eclampsia as a prophylactic measure, with the result that she passed through a normal labour and gave birth to a small, but healthy child. The placenta was full of

infarcts and had the appearance similar to that found in true eclampsia. The urine became albumen free on the 4th day and remained so till the patient was discharged on the 8th day.

Yet one more case may be mentioned here, because of certain points of interest connected with it.

The patient was a 3 - para Brahmin aged 19 yrs. The women of this caste are mostly intelligent and refined, and many of them can read and write. They are strict vegetarians and of cleanly habits. The men are largely priests and lawyers.

This patient when admitted was about 28 weeks pregnant. She was sent to us by a medical practitioner who had seen her having fits, and had diagnosed eclampsia. The patient's first pregnancy had been complicated by eclampsia.

Her condition on admission did not appear to me to be very convincing, but on the strength of the diagnosis, sent with the patient, routine treatment was at once begun. There was no sign of oedema, the blood pressure was normal, the urine was passed freely and contained neither casts nor blood and there was only a faint trace of albumen present. Her tongue showed no signs of having been bitten. She was in a semiconscious condition - a condition easily attributable to some native drug, which might have been and probably had been, administered. This

dazed condition yielded readily to the use of the stomach pump. In 2 days time, the urine was albumen free and remained so until the patient's discharge from hospital.

In 3 weeks time she was readmitted in very much the same condition, with the history of having had one fit. Again there was a faint trace of albumen in the urine. On this occasion, however, the systolic blood pressure was raised to 140 m.m. Hg. By next day, it was normal again. By the following day, the urine was again albumen free and remained so till normal delivery took place 2 months later.

The patient by her own wish stayed in hospital until the delivery took place, and during the period of waiting, I was able to observe the patient and to see that she was of a neurotic and emotional temperament. On several occasions she had a type of fit during which she rolled her eyes and clenched her hands and made a few spasmodic jerkings. I was present at one of these exhibitions and was able to satisfy myself as to the hysterical nature of the fit for consciousness was never actually lost.

These 3 cases taken along with one or two others to be mentioned presently, would seem to show that though eclampsia may occur twice in the same pregnancy, it is unlikely to recur in subsequent pregnancies. One may, therefore, suggest that one

(12)

attack confers a considerable degree of immunity.

SECTION III

"TIME OF ONSET AND COURSE OF THE DISEASE."

It is sometimes a matter of difficulty to recognise whether a case falls into the group termed "ante~~partem~~" or into that termed "intra~~partem~~" for we frequently find that a patient comes definitely into labour shortly after the symptoms of eclampsia first show themselves. Despite this fact we find that the largest group is that which contains the intra~~partem~~ cases.

Of my cases 35% occurred ante~~partem~~, 45% occurred intra~~partem~~ and only 20% post~~partem~~.

Most authorities find that ante~~partem~~ cases and post~~partem~~ cases occur in about equal numbers - the usual figure being about 20%.

The period of pregnancy at which the ante~~partem~~ cases occurred was from the 28th to the 40th week of gestation, the average being $32\frac{1}{2}$ weeks.

Cases in which an ante~~partem~~ attack of eclampsia becomes arrested and the patient's pregnancy subsequently goes on to full term, without recurrence of symptoms are not very common in my experience. In this series there were only 2 cases, each of whom had a mild attack of eclampsia when about 32 weeks pregnant. Both recovered completely and left hospital after a stay of about a week. One of them was a woman aged 26 years, belonging to the ~~Mudular~~ ^{Mudular}

caste, in her 7th pregnancy; the other was a primipara aged 20 years, belonging to the Chetty - that is the rich merchant caste. Both of these patients when discharged from hospital were passing normal quantities of normal urine, and their blood pressure and general condition were normal. The foetal heart was good in each case.

There are also included in this series 2 cases in which the primary attack became arrested, but in which a secondary attack took place some time later.

The first of these was a multipara, aged 16 yrs., belonging to the Naidu (or Kavari) caste. The women of this caste do not marry till puberty occurs, but do so as soon as can be arranged thereafter. Till then many of them go to school and lead a fairly full life. Their diet is a mixed one, meat and fish being partaken of where circumstances permit of this being done. The men are employed in business firms and in shops chiefly.

This patient was in the 29th week of her 4th pregnancy, all 3 previous pregnancies had terminated prematurely, as so frequently happens amongst Indian women to whom motherhood comes at an early age, and with whom one pregnancy follows another in rapid succession. She had had 5 fits previous to and 2 fits shortly after admission. The blood pressure was high, the systolic reading being 200 m.m. Hg.

The urine she passed was scanty and loaded with albumen. In spite of treatment the blood pressure remained high and the urine contained a considerable quantity of albumen, although the quantity passed was greatly increased. On the 5th day, the urine was nearly solid with albumen and during the 36 hours following only $\frac{3}{4}$ viii were passed. The usual prodromal symptoms of headache and oedema returned and the patient had one eclamptic seizure. After this her condition improved rapidly; albumen was only faintly present in the urine, and the amount passed increased up to 40 and 50 ounces daily. Oedema, however, persisted slightly and the blood pressure remained at or about 160 m.m. Hg. Repeated doses of veratrum viride had but a transitory effect.

Ten days later the urine though plentiful contained an increased amount of albumen and the foetal heart which up till then had been good, could not be heard. The patient again had one solitary fit and shortly afterwards came into labour and was delivered of a still born premature foetus.

Recovery thereafter, was rapid and when she was discharged a fortnight later, the urine contained only a very very faint trace of albumen.

The second case was that of a Brahmin primipara who was first seen in the antenatal dispensary when about 32 weeks pregnant. She showed the prodromal symptoms of oedema and albuminuria and though advised

to come into hospital for treatment, she disregarded the advice until a few days later, when she had an eclamptic fit. The urine contained a moderate amount of albumen, and though scanty was not suppressed. Her general condition was good, although the oedema was marked. She had one further fit. She responded readily to treatment, and in a week's time left hospital, albumen free and with no sign of oedema. For 4 weeks she continued to attend the antenatal dispensary, and, until the 4th week, remained albumen free and apparently in excellent health. Then the albuminuria returned, but the patient though again warned that delay in getting herself readmitted into hospital might mean return of the fits, remained at home for another week, with the result that she had another attack of eclampsia. There were four fits in all, and these were accompanied by the onset of labour, which terminated in the birth of a still born child. Recovery, thereafter, was uneventful and complete.

In the previous section I mentioned that recurrence of eclampsia in the same subject is in my experience extremely rare. From the above mentioned cases we see also that recurrence of eclampsia in the same pregnancy is comparatively common. This suggests that the foetus or something pertaining to

(17)

that particular foetus rather than the actual fact of pregnancy is the cause of the condition, and that until the foetus and its appurtenances are expelled, symptoms are quite likely to recur.

As regards intra and post-partem eclampsia, most cases in my series came on at or about full term. 78% of the intrapartem cases began to have fits during the 1st stage of labour, the remaining 22% began to have fits during the 2nd stage of labour. 75% of the postpartem cases had their first fit almost immediately after the conclusion of the 3rd stage; the remaining 25% within 12 hours of delivery.

SECTION IV.


"PRODROMAL SYMPTOMS & CONDITION OF THE URINE."

Certain symptoms are usually found to precede or accompany the onset of Eclamptic convulsions. Of these, the chief are headache, oedema, dimness of vision, vomiting, epigastric pain and constipation. Along with these symptoms, there often is raised blood pressure and certain characteristic changes in the urine viz.:— scanty output, albuminuria, and, except in very mild cases, high acidity.

All these symptoms and signs are not present in every case, but the combination of albuminuria, oedema and headache with raised blood pressure is very constant.

There was albuminuria in all my cases, and headache was complained of in varying degree by 95% of the patients. Oedema was noticeably present in 85% of the cases and in the remaining 15% was known to have been present by the change in the patient's appearance, when recovery was taking place.

The severity of a case cannot be judged by the amount of oedema present, for one of the most severe cases amongst those who subsequently recovered, was a patient in whom oedema was barely perceptible. In her case, fits were frequent and continuous and the coma which followed was deep and prolonged, and for



several days a fatal issue was expected. On the other hand two cases who showed marked oedema were comparatively mild. Vomiting was a feature noted in 50% of the cases, but in no case was it distressing to the patient.

Only 5% complained of epigastric pain and dimness of vision.

Constipation was present in every case except one in which there was trichonomas infection and consequently, mild diarrhoea.

In 80% of the cases the systolic blood pressure was raised to above 145 m.m. Hg.; the diastolic rise, when estimated, was usually found to be proportionate to the systolic rise. The highest blood pressure noted was 220 m.m. Hg.

Urinary changes are always to be found in eclampsia. Albumen, casts and blood are commonly detected while the output of urine is reduced, often to a dangerous minimum. In 80% of my cases, albumen was in excess, in 10% the amount was moderate, and in 10% - mild cases which cleared up rapidly - it was scanty in amount.

Macroscopically, blood was never found, though the microscope generally revealed its presence. The quantity of blood present in the urine is not nearly so noticeable as is usual in the urine of European patients suffering from eclampsia.

The same applies to the number of casts found. Simple hyaline casts were generally found and in one case fatty casts also were seen, but speaking generally they are not so readily seen as in the urine of European patients. Of all the changes connected with the urine, the amount secreted is of the greatest significance and is the chief desideratum in forming a prognosis.

In every case in this series, in which there was a fatal issue, there was almost complete suppression of urine. In not one of them was more than $\frac{1}{2}$ ounce of urine obtained within 24 hours.

SECTION V

In considering the case mortality of this disease in South India, we have to bear in mind the fact that the Indian woman has many adverse circumstances with which to contend.

Very often her physique is not good. This is to be accounted for partly by her sedentary habits and partly by the nature of her diet, which is often bulky and innutritious. The majority of them are simple and illiterate and know little of the laws of hygiene. In many instances the general health of a patient is undermined by concurrent or previous attacks of a debilitating disease such as syphilis, malaria, kala azar, dysentery or by infection by one or more of the various species of helminth. Most of these conditions are in themselves associated with a damaged liver and kidney, and patients suffering from them may show signs of oedema, albuminuria and fever. These conditions may even be said to be responsible in some degree for the high incidence of eclampsia in South India, in that their presence may precipitate an attack in an individual, who might otherwise have escaped with less severe manifestations of the toxæmia.

In any western country the presence of oedema is regarded as a warning that something is wrong and medical advice is consequently sought; but its

presence does not alarm the South Indian patient or her friends, who observe it so frequently amongst their non-pregnant friends. They therefore delay seeking the advice by which an eclamptic attack might have been averted.

Some patients before coming into hospital have undergone treatment at the hands of native doctors and drugs of questionable safety have been administered. Others have suffered at the hands of ignorant friends, whose well-intentioned efforts have been directed towards driving out of the patient the devil, which is presumed to be the cause of the convulsion.

For these reasons, and others connected with "auspicious" and "inauspicious" times for undertaking an enterprise, such as a journey to hospital, much delay often takes place, and the disease may be well established before treatment can be started.

In spite of these adverse circumstances the case mortality is rather lower than the high incidence would lead one to expect. From the hospital records of 5 years, we find the incidence to be 3.2 per 100 maternity cases.

At the conference of the F.E.A.T.M. already mentioned, some interesting statistics relating to diseases of pregnancy in India were given. The

figure for the average case mortality for the whole of India was given as 17.6% for eclampsia. For the purpose of comparison the figure for British hospitals generally was given, and was stated to be 13.4% for the same disease.

In my series the case mortality was 15%. The fatalities were confined to the primiparae and were distributed equally over the 3 groups; antepartem, intrapartem and postpartem.

There were certain features common to each fatal case:-

The temperature was high - 104° F. or above that; the pulse rate was rapid and remained between fits at a rate of over 128 beats per minute; the systolic blood pressure was at or above 190 m.m. Hg.; urine was almost completely suppressed; fits were numerous, 13 or more; all were profoundly unconscious between fits and died in deep coma; all were amongst the oldest of the primiparae.

In estimating the prognosis we see from what has already been stated that provided no obstetric abnormality exists, it depends primarily upon the output of urine. The scantier the output the more grave does the prognosis become. Albuminuria and oedema although usually prominent features of the disease, cannot be included amongst points of prognostic significance, for amongst my cases there

97
1 →

were severe cases where there was little albumen and oedema. The converse, however, is more generally the case.

Persistently high temperature and a pulse which remains rapid between convulsions are of serious import; many fits in rapid succession cause more alarm than many fits with a considerable interval between each; in the former case deep and prolonged coma generally follows the cessation of the fits, whilst in the latter case, light coma is maintained between fits and the patient usually becomes conscious within 12 hours of the cessation of the fits. The number of fits per patient varied from 1 to 24 in my cases. The average number per patient was 9.

Whilst the convulsion preserves in the main the character described in the text books as typical of eclampsia in the European, one or two minor differences now and then appear, in the natives of South India. One of these variations from the normal is associated with the preliminary tonic spasm; the patient instead of clenching the teeth firmly as is most usually the case, opens her mouth widely, her eyes meanwhile remaining $\frac{3}{4}$ shut. Thus her appearance is as of one suddenly arrested in the act of yawning.

Another difference sometimes observed is in the degree of fineness of the clonic spasm. The two extremes are represented by the Mohammedan class in whom it tends to be coarse, and the Brahmin class in whom it tends to be fine.

Before turning from the prognosis altogether, one is tempted to wonder whether, apart from the clinical manifestations enumerated above, the prognosis may not be affected also, though more indirectly by such factors as caste, diet, climate and other social conditions.

Whilst studying these cases I found that I was more ready to expect a favourable termination when I learned that the patient belonged to a caste of strict vegetarian principles.

The Brahmins are the chief example of this group and the disease seems to occur more rarely amongst them. They respond to treatment too more readily than do many other patients, and the number of live babies delivered is higher.

In order to see whether my observations were confirmed or not, I examined the hospital statistics for the previous 5 years and found that amongst the Brahmins 1 in 71 suffered from eclampsia, whilst amongst the non-brahmin section of the community 1 in 27 were affected.

Of the Brahmin mothers 83.33% recovered and of their babies 80% were discharged alive and well.

Of the mothers of other castes 80.7% recovered but only 30% of the babies were discharged alive and well.

Climate is another condition which may have some influence upon the incidence of and prognosis in eclampsia. In parts of India, such as Delhi and Agra where the climate is dry, the hospitals admit very few cases.

Cases are more numerous in South India about the months of March and April, the season when dew is heavy and when short sharp showers of rain, locally known as "mango showers" frequently fall. I remember noticing how on one occasion when there came a sudden recurrence of the monsoon rain after the hot weather had set in, there seemed to be quite an outbreak of eclampsia, as many as 7 cases being admitted to the maternity ward, within 16 days. In cases of this sort - "precipitated cases" as I have come to term them - I have generally found that the prognosis is favourable. The disease runs a milder course than it does in cases where the history indicates that pre-eclamptic symptoms have been present for some time.

Apart from the immediate prognosis, the obstetrician may be called upon to give an opinion upon

two other points viz:-

1. The permanency of after effects.
2. The likelihood of recurrence in a subsequent pregnancy.

1. A mild type of mental derangement is an after effect which is more common amongst the women of South India than it is amongst European women. Its appearance causes considerable alarm to the relatives. What usually happens is that on the 2nd or 3rd day after consciousness returns, the patient becomes restless and noisy and tries to get out of bed; if successful in her attempts, she wanders about in an aimless fashion, singing and laughing. She ignores her infant and declares it to be the offspring of some other patient. She makes no effort to feed herself, but allows herself to be fed, merely protesting, every now and then, that she won't take any more. Patients who suffer in this way are quite docile and easily managed, and their mental condition usually returns to normal within a few days time. One is able therefore to reassure the patients' friends, on the matter, and tell them that the symptoms are temporary and that recovery is likely to be complete.

2. Concerning the recurrence of eclampsia in future pregnancies, I always tell the patients that it is unlikely, but at the same time advise them to place

(28)

themselves under medical supervision from the 5th month of gestation, onwards. I find that patients who have once suffered from eclampsia, more than any others, are willing to undergo ante natal treatment.

SECTION VI

"MORTALITY & PROGNOSIS FOR THE CHILD."

The chance of survival of the child in eclampsia is usually estimated at 50%. In Southern India the mortality rate is more favourable. ~~some~~ Amongst my cases the percentage of still births was 30%, and those who died before the patient was discharged from hospital were 5% making in all, a total case mortality rate of 35%. Of these, 33% were intrapartem cases and 67% were antepartem cases. There was no foetal mortality amongst the postpartem cases of eclampsia.

The prognosis for the infant depends upon:-

1. The facility and expedition with which it can be delivered. Abnormalities of the foetus and abnormal lies cause delay and interference, and cause the already grave prognosis to become much more so. Of my cases 15% were breech presentation and were all still born. No cause could be found for the malposition, beyond the common cause of prematurity.

2. Obstructed labour due to tumours, contracted pelvis etc.

Fortunately, the diseases which cause abnormal conditions of the bony pelvis are uncommon in Southern India. Osteomalacia, which is very common in many parts of Northern India is practically unknown in the

South. Early and late rickets also are rare diseases. Therefore, this factor was of no importance amongst my cases.

3. The length of time prior to the birth of the infant during which symptoms of toxæmia have been present in the mother.

Chronic absorption of toxin, such as occurs in cases where the onset of symptoms is insidious, and exacerbations occur in spite of treatment, are more disastrous to the child, than are cases where there is a sharp attack spread over a shorter period.

4. Prematurity.

The majority of births in eclampsia are premature, and the more premature the child is, the less likely ^{it is} to survive.

Yet, on the whole these Indian infants have a better chance to survive than have the premature infants born in Western countries. In the hot climate of South India, the premature infant is more able to survive without the application of artificial heat, and this is probably the reason why the infant mortality rate in eclampsia is lower in South India than it is in Europe.

SECTION VII

"PROPHYLAXIS & TREATMENT."

The Prophylactic treatment of eclampsia may be considered under 2 heads:-

- A. Medical
- B. Obstetrical.

A. Medical.

Efficient antenatal supervision is the most important measure for preventing the onset of eclampsia and this, amongst the women of South India is not an easy ideal to ^{at} obtain.

Anything which calls for regular effort or routine does not appeal to the easy going Indian mind. Money is scarce, distances are long, bullock carts travel slowly, therefore, it would be pure waste of time to attend a dispensary once a fortnight merely in order to get the urine tested!

Where pregnant women, who live near and have therefore been able to attend the antenatal clinic regularly have done so, the results have been very encouraging. Out of over 1,600 cases only one has developed eclampsia, so far as I know. That patient has already been referred to in Section III, along with details concerning her; she too, no doubt would have escaped had she taken full advantage of the advice given to her.

As soon as albumen is detected in the urine of a pregnant patient attending the clinic, she is closely watched and advised to have her urine tested not less often than once a week. She is instructed to restrict her diet to fluids, milk, rice water and cunjee, and to avoid entirely meat, fish, and eggs. She is told to regulate her bowels so as to have at least 2 ^{rec} full motions daily. If the urine is acid as it almost invariably is, an alkaline mixture is prescribed to be taken 2 hourly, until the urine is neutral and thereafter, twice daily. Sometimes to an intelligent patient, a piece of blue litmus paper is given and its use explained.

B. Obstetrical.

In cases of albuminuria which either recur or persist, the choice lies between induction of premature labour, and allowing the patient to run the risk of developing eclampsia later.

My own experience of antenatal work leads me to think that a policy, which avoids interference is justified. A great many cases of albuminuria occur amongst the patients attending the clinic, but they respond readily to medical treatment.

I would place in a different category however, patients with albuminuria who develop eclampsia but recover and improve before labour is due.

Theoretically induction would be good practice, particularly in such cases as are in the last 6 weeks of their pregnancy, and where the foetal heart is good. Practically however, I find myself so buoyed up with the hope that any signs of amelioration of symptoms may prove permanent, that I refrain from interfering, and too late am confronted with a sudden exacerbation, terminating in fresh fits and probably, the onset of labour pains.

TREATMENT OF ECLAMPSIA.

The satisfactory treatment of any disease depends primarily upon a knowledge of the etiology of that disease. In eclampsia this exact knowledge is not as yet ours, but in modern days theory has veered round from anaphylaxis, auto-intoxication, foetal serum etc. to concentrate very definitely upon the placenta as the site of origin of the disturbing factor.

Whatever the cause may or may not be, one thing at all events, would seem to be evident and that is, that the organs of metabolism and excretion are temporarily upset. This is shown by retention of chlorides, increased output of undetermined nitrogen, scanty output of urine, constipation etc., and treatment can with reason be directed towards restoring

the function of these disabled and overtaxed organs, and towards eliminating the toxins and foreign proteins that have been thrown into the circulation as the result of the degenerative changes, which have taken place in the liver and kidneys.

Speaking generally, treatment is based upon the following broad principles:-

1. The control of fits.
2. Elimination of toxins.
3. Lowering of the blood pressure when high.
4. The acceleration of delivery.

Various recognised lines of treatment have enjoyed popularity from time to time, and each applies treatment in order to attack the factor which the originator considers to be of greatest importance.

At the present time the best known lines of treatment are:-

- A. Stroganoff's method.
- B. The modern Rotunda method.
- C. American method.

A. Stroganoff apparently considers No.1, the control of fits, to be the first essential ⁱⁿ of treatment and relies for his results on hypnotics as the means of doing so. He advocates the free use of morphia, chloral and chloroform, but avoids any treatment which might possibly stimulate fresh fits such as, for example, a simple enema or a stomach wash. He emphasises the importance of nursing the patient in

a quiet room and in a subdued light.

Venesection, which was for long considered to be an essential part of the treatment of eclampsia, he considers useful in certain cases, where the patient is robust and where the blood pressure is high.

In South India any method of treatment which includes the use of venesection has little to recommend it, for the natives are essentially anaemic and of poor physique, and not many of them are sufficiently full-blooded to stand such a drastic procedure.

B. The modern Rotunda method makes No.2, elimination of toxins, its chief aim. It avoids whenever possible the use of morphia and chloroform, but urges strongly the use of the stomach wash and large colon wash, depending upon these for a fourfold result:-

- (a) The removal of one fertile source of auto-intoxication.
- (b) The stimulation of the organs of elimination.
- (c) The lowering of the blood pressure.
- (d) The stimulation of labour pains.

Thus we find the Rotunda method to be the very antithesis of the Stroganoff method.

C. The American method has as its special feature No.3, the lowering of the blood pressure. This, it

does by means of intravenous injections of Magnesium Sulphate in 20 c.c. doses of a 10% solution. After each fit an injection is given, if the systolic blood pressure is above 150 m.m. Hg. Any restlessness occurring between fits is controlled by Bromide in 60 gr. doses alone, or combined with Chloral Hydrate in 20 gr. doses. Venesection is used in many cases $1\frac{1}{2}$ to 2 pints of blood being withdrawn.

In certain respects this method resembles that of Stroganoff, but the use of hypnotics particularly Chloral Hydrate is much less freely used and, whereas Stroganoff advocates the withdrawal of only $\frac{1}{2}$ pint of blood by venesection, this method withdraws about 3 times that amount. Whilst admitting as most advocates of the use of morphia do, its deleterious effect upon elimination and its tendency to encourage oedema of the lungs, the American method includes its use, but restricts it to that of an initial means of controlling a restless patient.

All three methods recognise the advisability of stimulating labour pains and accomplishing delivery by legitimate obstetrical methods such as the application of forceps during the 2nd stage, as speedily as is consistent with safety to the patient.

After trying various lines of treatment I came to the conclusion that the best results were obtained

by conservative methods and by adopting a definite routine, which should be adhered to in spite of all temptations to undertake more heroic measures, in cases which appear to be becoming more and more urgent.

One of the chief desiderata in formulating a routine line of treatment is the aim of treatment, and this I consider to be:-

1. To control the urgent symptoms.
2. To stimulate elimination and re-establish renal function.
3. To lower the blood pressure when high.
4. To stimulate labour pains.
5. To anticipate the common complications.

The line which commends itself as being most suitable for routine purposes is the modern Rotunda method and this is now employed in all my cases, together with such supplementary treatment as may seem necessary to meet the special needs of the case.

A. Medical treatment.

This is begun as soon as possible after the patient is admitted, and in undelivered cases not in the 2nd or 3rd stage of labour, is as follows:-

A hasty preliminary abdominal and rectal examination is done in order to ascertain the stage of labour and the lie and position of the foetus.

(38)

Then the blood pressure is taken and if the systolic pressure is found to be about or above 160 m.m. Hg., and the condition of the pulse appears to be satisfactory. Otherwise, 0.5 c.c. veratrum viride is given subcutaneously and subsequently repeated if considered advisable. Morphia is never used by me, but if a patient is very restless 1/12th gr. heroin is given but not repeated. Meanwhile preparations for a colon wash have been made and a high colon wash is next given, in the manner recommended by Fitzgibbon in his book "Practical Midwifery." To this proceeding some physicians object, on the ground that it is an additional source of irritation to the patient, and therefore liable to stimulate fresh fits. This may be true to a certain extent in cases where difficulty is experienced in passing the tube round the bend in the rectum, but where the operator has had some practice, this ceases to be a difficulty, and the patient generally lies quietly after the tube has been fully inserted. The colon wash takes about 1½ hours to accomplish satisfactorily. When the ^{TURN}rectum flow is nearly clear, a few ounces of the Soda Bicarb. solution to which 3ss glucose has been added is run in and left to be retained; in this particular, the Rotunda routine is departed from, and the glucose solution takes the place of the

? veratrum

purgative recommended by Fitzgibbon.

A stomach wash with a weak solution of Soda Bicarb, follows the colon wash, and a purgative of Mist. Senna Co. ℥ iv & Mag. Sulph. ℥ iv is left in the stomach.

In South India the diet of the patients is one which leaves a large residue, and the bulk of each meal is very large. This accounts for the very large results obtained from both colon and stomach wash in nearly every case.

Before the patient is sent to the ward, a hot antiseptic vaginal douche is given with the double object of counteracting the effects of the handling the patient may have had before admission by the native midwives, and of stimulating labour pains and dilatation of the Os.

As soon as the patient has been put to bed on her side, if possible in a room by herself in a quiet part of the hospital, a large linseed poultice is applied to the loins and changed 4 hourly, the second being ready for application before the first is removed.

The purgative is repeated in 6 hours if the patient can swallow.

In serious cases with persistent fits or deep coma, the colon wash, but not the stomach wash, is repeated in 6 hours.

To patients who are running a favourable course plain boiled water and weak alkaline drinks are given till the 2nd day after delivery, when rice water, barley water and milk are added as diet. This is gradually increased to sago or arrowroot cunjee with milk till by the 6th or 7th day, the patient is taking her ordinary diet of curry and rice.

Concurrent pathological conditions are almost invariably present, helminth infection being very common, and these conditions are dealt with as early in the convalescence as possible.

B. Obstetrical treatment.

A large number of eclamptic patients go through a short and easy second stage. Whenever such a patient is found to be approaching the 2nd stage, forceps are got ready and are applied as soon as the conditions for forceps are fulfilled, unless the 2nd stage seems likely to be unduly short. We are influenced also to some extent by the condition of the foetal heart. Forceps are applied if possible during a period of unconsciousness or coma in order to avoid the use of chloroform, and particular care is taken in all matters relating to asepsis, for eclamptics are reputedly liable to septic infection.

Severe cases of antepartem eclampsia are often

a cause for anxious hesitation on the part of the obstetrician. The temptation to employ some form of accouchement forcé is great.

My cases are all given the routine medical treatment outlined above, and in addition attempts are made to induce labour with Quinine. Methods of induction which require manual interference are not employed, but quite frequently we find that quinine sulphate given in 5 gr. doses every $\frac{1}{2}$ hour for 6 doses has the desired effect.

From the results of investigations carried out and published in 1922 by the Committee of the Section of Obstetrics & Gynaecology of the Royal Society of Medicine upon "the prognosis and treatment of eclampsia" it is evident that the more active forms of treatment are to be deprecated. It was shown that in the maternal mortality, the ratio between mild and severe cases remained very constant; the significant fact however, was that where accouchement forcé was undertaken, the mortality rate was raised to an alarmingly high level, irrespective of the degree of severity of the case. Therefore, though Caesarean section may have its place in rare selected cases, such methods of accouchement Forcé as cervical incision, vaginal hysterotomy etc. are entirely to be condemned.

(42)

Patients who require to be treated postpartem, receive treatment along the lines laid down under "medical treatment." While the colon wash is being done, very great care is taken to protect the vulva and vaginal orifice with a sterile towel. In instances where there is laceration of the perineum the colon wash is omitted, unless symptoms are very severe; it is omitted also in all mild cases.

I thought it would be interesting to classify my results 1st from the medical standpoint and 2nd from the obstetric standpoint.

A. MEDICAL

	Cases	Maternal Mortality	Foetal Mortality
Purely eliminative	35%	14.3%	29%
Eliminative & Veratrum	20%	25%	nil
Eliminative & Sedatives.	25%	20%	60%
Eliminative & Sedatives & Veratrum	21%	nil.	50%

B. OBSTETRICAL.

	Cases	Maternal Mortality	Foetal Mortality
Undelivered	15%	33%	nil
Spontaneously delivered	60%	17%	50%
Forceps delivery	15%	nil	nil
Induction	10%	nil	50%

Septic Infection is said to be one of the most common sequaelae associated with eclampsia. In only one of my cases however, did the temperature rise again after the initial pyrexia was over, and in that case the rise of pulse rate and temperature were accounted for by inflammation of one breast, which occurred on the 9th day.

In all 3 fatal cases the temperature remained high until death - in 2 of these cases within a few hours of admission. The 3rd case was complicated by a severe and very fatal form of anaemia, which contributes very heavily to the maternal mortality rate in India. In her case, the temperature remained high till her death on the 5th day. One cannot be certain that septic infection was not a contributing

factor in such a case.

The women of India seem to be peculiarly resistant to septic infection, and we see many patients who have undergone an almost unbelievable amount of unskilled handling and examination, without showing worse effects, than a reactionary rise of pulse rate and temperature for a few days.

In the face of these circumstances, it may be but lost labour on our part to take rigid precautions to guard against sepsis, nevertheless, we avoid vaginal examinations in all cases where the diagnosis per rectum is clear, and we do not permit pupil nurses and students to deliver cases of eclampsia.

CONCLUSIONS.

1. That the reasons why the incidence of eclampsia is higher in South India, than it is in Western countries are probably:-
 - (a) the higher percentage of young primiparae.
 - (b) the greater number of factors, which may precipitate an attack in border line cases of albuminuria.

2. That the influence of climate, social conditions and caste is of some importance:-

Climate, in that it is enervating and encourages sedentary habits; Social conditions, because of the superstitions and traditions, which consider as an essential part of the confinement, the presence of the untrained barber-woman as midwife-in-chief; Caste, because of the individual caste regulations, which control such conditions as diet, early marriage and its consummation, purdah and education of women.

3. That the hope for the future of the young mothers of Southern India lies in the provision of an increased number of accessible ante-natal centres, with well trained health visitors and corporation nurses attached, who may be expected to supercede eventually the untrained Barber-woman class of midwife.

BIBLIOGRAPHY.

Balfour, Indian Med. Gazette, Nov., 1927. p.646.

Berkeley & Bonney, "The Difficulties & Emergencies
of Obstetric Practice." p. 48.

Berkeley, Russell Andrews, Fairbairn, "Ten Teachers,
p. 111.

Fitzgibbon, "Practical Midwifery," p.252.

" The Lancet, March 31st, 1923. p. 657.

Jellet, "A Short Practice of Midwifery," p.290.

Johnstone, "Text Book of Midwifery," p. 244.

Journal of American Medical Association, July 24,
1926.

Playfair, "Science & Practice of Midwifery, Vol II,
p. 321.

"Report of Committee of Section of Obstetrics &
Gynaecology of Royal Society of Medicine upon the
Prognosis & Treatment of Eclampsia." June 30th, 1922.

