Remarks

ON

THE OLD MULTIPARA.

THE INFLUENCE OF AGE AND PARITY UPON
MATERNAL MORTALITY.

BY

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THE necessity for the pre-natal supervision of the primigravida is now generally recognized, but the needs of the multipara are not so clear to the public or the profession. When a woman has successfully borne several children she is considered to be an accomplished performer, and the supervision of her pregnancy is looked upon as an unnecessary and expensive luxury. The fallacy of this belief is exposed in the clinical reports of all maternity hospitals, which show the mortality risk for a woman of 40 to be three times as great as that of a primigravida of 18. Among the chief factors for this striking difference are (1) the bodily changes set up by repeated child-bearing, and (2) the physical declension due to advancing age. The significance of these two factors will be considered separately, but it should be noted that in most cases they are contemporaneous in their appearance and similar in their action. The general result of their joint effect upon the maternal mortality is shown in the following tables (slightly modified) published by Menzies.¹

Age:	15	20	25	30	35	40-45
I. Death rate per 1,000 births (married and unmarried mothers):						
Pre-natal ...	0.20	0.17	0.24	0.37	0.73	1.59
Natal ...	1.81	1.69	1.91	2.41	3.32	7.35
Post-natal ...	1.97	1.01	0.94	1.10	1.42	3.32
Total ...	3.98	2.87	3.09	3.83	5.47	12.26
II. Death rate per 1,000 births (married mothers only):						
Pre-natal ...	0.13	0.16	0.23	0.37	0.73	1.59
Natal ...	1.18	1.52	1.86	2.41	3.32	7.35
Post-natal ...	1.28	0.91	0.92	1.09	1.42	3.32
Total ...	2.59	2.59	3.01	3.87	5.47	12.26
III. Estimated comparative mortality of primigravidae and multiparae:						
All confinements...	2.59	2.59	3.01	3.88	5.47	12.26
First confinements ...	2.75	3.44	5.01	7.16	10.41	23.73
Subsequent confinements ...	1.38	1.72	2.51	3.58	5.21	11.86

These tables have been corrected for illegitimacy, and further adjustments have been made for the added risk that is considered to be attached to a first labour, and also for the relative frequency of first as compared with other labours. It is claimed that illegitimacy doubles the risk for the mother, and that a first labour is twice as dangerous as any other, although the author admits that his calculations are not capable of statistical proof, and must be, to some extent, arbitrary; my own clinical experience is in agreement with the general principle, but does not support such a high ratio. If, for example, the risk of a first labour were double that of other labours, then the low mortality figure given by Menzies for the 15-20 group, which is composed mainly of primigravidae, would not be credible, especially when the relative frequency of illegitimacy among very young girls is taken into account. Moreover, Menzies himself casts doubt on his own assessment. He quotes Coghlan to show that, the age of the patient remaining the same, the first confinement is always

the most dangerous, and that the risk diminishes with the next two or three labours, to rise again with each successive pregnancy after the fourth. It will be seen that Coghlan's conclusions support Menzies's principles rather than his figures.

Children borne.	Coghlan's Table.					Average maternal risk per 1,000 births.
1 ...	...	...	...	...	...	8.8
2 ...	...	...	...	...	...	6.74
3 ...	...	...	...	...	...	6.32
4 ...	...	...	...	...	...	6.05
5 ...	...	...	...	...	...	6.21
6 ...	...	...	...	...	...	6.23

The broad conclusions to be drawn from these statistics are strongly supported by clinical experience, and from a consideration of both these sources of information there emerge three generalizations of great importance: (1) there is a special risk attached to the first labour, whatever the age of the patient; (2) there is a special risk attached to age, whatever the parity of the patient; (3) increasing parity is associated with a diminishing risk up to the fourth labour, and after that with an enhanced risk that increases with each successive pregnancy.

THE EFFECTS OF PARITY.

The first act of parturition is associated with two special dangers: (1) a high incidence of toxæmia, and (2) certain mechanical difficulties and traumata.

Although there appears to be definite evidence of the recurrence of toxic symptoms in the subsequent pregnancies of patients who have suffered from eclampsia, eclampsia proper is almost entirely restricted to primigravidae, and the maternal mortality from eclampsia is definitely greater than that resulting from comparable toxic sequelae in multiparae. It is likewise true that the presence of a mechanical obstacle to delivery (competent to produce obstruction) is often unknown in the case of a primigravida until the onset of labour, whereas the multipara has the benefit of her past experience to guide her in the matter.

Both eclampsia and dystocia are largely amenable to pre-natal care, but even when the greatest care has been exercised (and it is doubtful whether 50 per cent. of pregnant women yet receive the necessary minimum of pre-natal supervision) there are fulminant cases of toxæmia which escape detection, and there are women in whom the mechanical relationships of mother and infant remain doubtful until the trial of labour has taken place. Even in normal cases there is the rigidity of the soft parts of the nulliparous pelvic floor to resist dilatation and lengthen labour, whilst the virginity of the birth canal renders bruising, contusion, and laceration of the tissues an almost unavoidable feature of a first labour. These traumata lead to shock, haemorrhage, and sepsis, and, taken in conjunction with the high incidence of toxæmia and dystocia, impose an obvious load on the puerperal risk of the primigravida. The multipara, on the other hand, is protected by her history, for the very fact of past difficulty will draw attention to the present need of special examination and treatment. Too much stress must not be laid on the significance of an uneventful obstetric history, for blind reliance upon a blameless past will create a sense of false security, and may lead to disaster.

It is easy to see why the two or three labours that succeed the first should be less dangerous for the mother: the peculiar difficulties of the primigravida are past, the soft parts are no longer a formidable barrier, and the patient is still youthful and vigorous. As parity increases, however, it brings with it certain changes that gradually increase the risk of childbirth—namely, calcium depletion, loss of muscle tone, and a tendency to haemorrhage.

Calcium Depletion.

Calcium depletion is set up by excessive parity, rendering the muscles painful and flabby and enhancing the effects due to loss of muscle tone. In advanced cases this loss of calcium may affect the bones, for although true osteomalacia is rare in this country, there are minor grades of this disturbance which escape recognition. It must therefore be remembered that the repetition of parturition and

lactation, especially when combined with poverty, overwork, and underfeeding, may set up a decalcification of the pelvic bones and cause a shrinkage in the bony birth canal that may react upon the mechanism of labour.

An interesting clinical commentary on this assertion is afforded by the following analysis of the age-parity grouping of a series of 200 cases of craniotomy taken consecutively from the reports of six well-known maternity hospitals.

Craniotomy Table.

Parity	Cases.	Age.	Cases.
6-para ...	17	38 ...	2
7-para ...	3	39 ...	7
8-para ...	4	40 ...	7
9-para ...	10	41 ...	6
11-para ...	1	43 ...	2
12-para ...	5	44 ...	6
14-para ...	2	45 ...	1
15-para ...	1	46 ...	1
16-para ...	1	47 ...	1

Of these women, 44 were 6-parae (or *plus*) and 33 were 38 years of age (or upwards). In the majority of cases the early confinements had been easy, and a general survey of the whole group shows clearly that the higher degrees of parity are associated with a special tendency towards a peculiar form of dystocia whose true significance is often missed until the indications for craniotomy have become urgent. Few of these patients show any gross mechanical defect, and most of them have a deceptively innocent past history; the difficulty is essentially due to the combination of two factors, both insignificant apart from the other—the first a minor mechanical obstacle to delivery, such as a large child, an incompletely flexed head (persistent occipito-posterior), or a partially decalcified pelvis, and the second a defective musculature, which seriously interferes with the cardiac response of the patient and also reduces and misdirects the expulsive powers of the uterus. Unhappily, the case may be regarded as a type of primary inertia and treated along expectant lines, as if secondary were merely an advanced stage of primary inertia.

There may be a deficiency of pressor bodies in the blood of both kinds of patients, but the condition is otherwise quite different in its pathogenesis and prognosis, for, whereas primary inertia indicates nothing more than simple muscular weakness, the appearance of secondary inertia indicates the failure of the uterus to overcome a mechanical obstacle to delivery, and is therefore a definite and distinct type of obstructed labour.

Loss of Tone.

Loss of tone in the uterine muscle is responsible for inertia, prolonged labour, and post-partum haemorrhage, and it also produces a flaccidity of the walls of the uterus that destroys and distorts the shape of this organ. This loss of shape permits malpresentations of the foetus, and is a direct cause of dystocia. These changes are not restricted to the uterus, but affect the skeletal muscles; the flabby abdominal walls of the multipara resemble the flaccid uterus in their action upon the expulsive powers and their proneness to produce malpresentations (transverse lies and occipito-posterior presentations). Further, the uterus, deprived of the muscular support of the abdominal wall, is itself prone to dislocation, and may assume a position of extreme obliquity (pendulous belly). Severe displacements of this kind, unless they are spontaneously rectified or deliberately corrected by posture, manipulation, or the application of padded binders, may very adversely affect the course of labour. Extreme uterine obliquity is a well-known cause of face, brow, and shoulder presentations, which are in themselves a serious menace to the mother; but there is also a deflection of the long axis of the uterus which may seriously interfere with the fixation and descent of the presenting part, and unless the normal relationship of the long axis of the uterus to the planes of the pelvis is restored the efforts of the uterus to push the presenting part into the brim may be entirely misdirected, and thereby rendered quite nugatory. This kind of defective uterine action leads to exhaustion of the uterus, and is one of the underlying causes of the special form of obstruction known as secondary inertia.

Haemorrhage.

That parity produces a tendency to post-partum haemorrhage is a commonplace, but its relation to ante-partum haemorrhage is not so obvious. There can, however, be little doubt that concealed ante-partum haemorrhage commonly attacks the old multipara who is pale and flabby and has a trace of albumin in the urine. This relationship between ante-partum haemorrhage and age is clearly brought out in the well-known paper by the late Gordon Lev.² Analysis of his fifty cases from the point of view of age and parity reveals the following:

Age.	Cases.	Parity.	Cases.
19 ...	2	Primigravidae ...	8
21-24 ...	6	1-para ...	5
25-29 ...	12	2-para ...	5
30-39 ...	20	3-para ...	6
40-43 ...	10	4-para ...	5
		5-para ...	3
		6-para ...	1
		7-para ...	2
		8-para ...	4
		9-para ...	7
		12-para ...	3
		15-para ...	1

When due allowance has been made for the comparative rarity of childbirth after the age of 40, and also for the relative infrequency of the higher degrees of parity, this analysis suggests that concealed haemorrhage (like secondary inertia) is an important feature of obstetric old age.

THE INFLUENCE OF YOUTH.

The influence of extreme youth is best considered in conjunction with the role played by illegitimacy. The latter is complex; the majority of patients are in their first pregnancy, and therefore subject to the risks peculiar to that state, whilst there is a high incidence of venereal disease and a general disposition towards concealment, which, to be successful, involves the neglect of medical aid before, and sometimes during, the confinement. As illegitimate cases include a high proportion of all pregnant women below the age of 18, the possible effect of physical immaturity must also be taken into account.

The exact age at which the pelvic bones and organs reach their maximum development is unknown, but it seems unlikely that this should occur at, or immediately after, puberty. On one occasion I had an opportunity of observing the growth of the pelvis of a young girl who first came under observation when pregnant at the age of 15½. She was measured during this first pregnancy, and again at the age of 17 and 18 years, and her pelvic measurements were found to have increased on each occasion.

The presence of a marked degree of under-development must be a source of danger, but it is a rare condition, because there is a close, protective relationship between the hard and soft parts of the pelvis on the one hand and the powers of conception on the other. In this country, at any rate, there are few expectant mothers with a physical development so incomplete as to be infantile in type, for puberty (and with it the power of conception) does not occur until infancy has passed. In Eastern countries, however, puberty comes on at a much earlier age, and pregnancy is relatively common in childhood, and here the presence of dangerous degrees of immaturity has no doubt some effect on maternal mortality, although the high morbidity which prevails is probably due to neglect and ignorance rather than to lack of development. A clear distinction must therefore be made between the infantile pelvis of the East and the pubescent type which is sometimes found among young pregnant girls in this country. It is true that this pelvis shows a certain amount of under-development, but it is formed of incompletely ossified bones, and its several elements are united by ligaments of great elasticity, and as a result the pelvic joints are capable of much opening out during labour. These several factors produce a general resiliency, which easily compensates for a small reduction in size—in other words, the youthful pelvis is functionally bigger than its actual measurements.

Menzies's tables afford an interesting commentary on this aspect of the subject, for the mortality in the 15-20 group is distinctly greater than that of the three succeeding

groups, and clearly shows that extreme youth entails a special danger for the mother. At the same time it must be remembered that this group includes all the youngest patients and a very high percentage of illegitimate births and first labours. The influence of these several factors cannot be ignored, but their individual importance must not be exaggerated; indeed, in comparison with the mortality after 40, the death rate under 20 years of age calls for little comment beyond the obvious conclusion that the very young unmarried mother demands special care and attention before, during, and after labour.

THE EFFECT OF AGE.

The human body may approach old age in a pathological or a physiological condition, although both these states are usually combined, since few individuals are free from some organic defect or weakness. Even in the presence of perfect health advancing age causes tissue atrophy or physiological wear and tear that reduces the activity of the organs of the body and absorbs their reserve power. Any such progressive impairment of function will reach a point in the course of time at which the whole of the reserve power is fully mobilized and the individual is incapable of further effort. The result of these changes is well shown in the athlete whose physical perfection declines between the age of 25 and 30 and is lost five or ten years later. In the same way as loss of youth unfits the athlete for great effort, so does the effect of time react upon the pregnant woman and make her less fit to meet those exceptional demands of parturition which fall chiefly upon the excretory system during pregnancy and the musculature and heart during labour.

The local effects vary in kind and degree with the particular organ affected, but in most women of advancing age there are definite changes in the myocardium, kidney, and uterus. The general result of the whole process is to lower the resistance of the patient, to reduce her capacity for work, and to render her more sensitive to fatigue and shock.

Pathological Age.

The action of advancing age upon any organic defect or disease is dependent upon many factors, and especially upon the site and nature of the lesion. Many diseases are progressive in character, and their disabling effects increase automatically with age. In most women, therefore, the ravages of time are not only physiological, but pathological in type, and, as might be expected, the increase in puerperal mortality which sets in after the age of 35 runs to a large extent parallel with the rising mortality rate found among comparable non-pregnant women.

The present communication is not concerned with the role of independent organic disease except in so far as it has a bearing upon the relationship of age and parity to parturition, but it appears to be sometimes forgotten that an organic defect or disease is no respecter of persons, but affects the pregnant as well as the non-pregnant woman, and therefore constitutes an important contributory cause of death during childbirth among women belonging to the older age groups. Furthermore, the process of reproduction has a potent influence upon many diseases, either by enhancing their effects or stimulating the development of their lesions. Excessive child-bearing may therefore shorten the time required by an organic disease to arrive at its lethal stage; thus both age and parity may form a close liaison with organic disease, and through this medium exert an important if subsidiary influence upon maternal mortality.

TREATMENT.

It has been shown that age and parity have an influence upon child-bearing that is potent, reciprocal, and often symbiotic, but it is not possible to lay down any hard-and-fast rules concerning treatment. Each case must be judged on its own merits, and a careful general and local examination made; due consideration must be given to the age of the patient and the amount of physiological wear and tear (physiological factor), and also to the presence of pathological lesions and the stigmata of excessive parity (pathological factor). These factors combine to form what may be termed the obstetric age of the patient, which it

must be remembered may differ greatly either from her actual age or the number of her pregnancies. When, however, obstetric old age is discovered as a result of this investigation, it is necessary to determine the character of the pregnancy before proceeding to treatment; for this purpose some ante-natal classification is essential, and the following method of dividing all pregnant women into three groups is both simple and useful.

Group 1. The grossly abnormal group (eclampsia, tumours, severe pelvic contraction, heart disease, etc.).

Group 2. The apparently normal.

Group 3. The doubtful.

Group 1.—The treatment of the first group follows well-recognized general principles that are largely independent of both age and parity.

Group 2.—In this group the age-parity factor is of decisive importance, for when a woman has once entered obstetric old age she can never be regarded as perfectly normal, and hence all old multiparae who do not belong to Group 1 must be deliberately placed in Group 3.

Group 3.—No generalizations are permissible with regard to this group, which is often a source of anxiety and difficulty to the most experienced ante-natal physician. Into this class must be put women with a minimal pelvic contraction, a slight trace of albumin, and those who reveal some minor organic defect; it includes others who reveal no obvious abnormality, but give an unsatisfactory history of forceps deliveries or stillbirths; and, last but not least, the special type with which this paper is primarily concerned—namely, the old multipara.

The treatment of this type of patient depends upon the application of the following rule: that whereas one minor disability when acting alone is often harmless, the combination of two or more minor defects, mechanical or otherwise, is always potentially dangerous. It produces a symptom-complex of a gravity far beyond that of its component parts, and one that demands much more drastic treatment than would at first sight appear to be justifiable.

It is essential that every effort should be made to avoid a second complication in a pregnancy that is already even slightly abnormal, and if this cannot be done, the case must no longer be classified as doubtful, but regarded and treated as belonging to the grossly abnormal group. No class of patient affords a better example of this than the old multipara, and the high mortality seen among these women will persist until it is generally recognized that the symbiosis of old age and parity with other minor defects is both powerful and dangerous; when, however, the importance of this principle is conceded, the treatment of the old multipara and her companions in the doubtful ante-natal group is much simplified.

It should be generally known that the mortality risk increases with the age of the mother, and therefore child-bearing should be undertaken in the earliest years of married life, and not postponed to some more convenient time in the future. Families should not be restricted to one or two children, because such restrictions, by relatively increasing the number of first pregnancies, raise the general maternal mortality and are therefore prejudicial to the interests of the State. Four or perhaps five children should be regarded as an ideal number, but further reproduction should be discouraged on account of the increased risk that attaches to the higher degrees of parity. Some of the deleterious effects of age and parity can be counteracted in a general way by improving the sociological conditions of the community with regard to food, wages, and housing. The provision of an efficient obstetric service that includes ante-natal, natal, and post-natal supervision is capable of retaining for the motherhood of this country a large proportion of that youth which disappears so quickly in the presence of economic distress and indifferent midwifery.

The universal application of ante-natal care is urgently required, but it can never replace the need for skilful attendance during labour itself; much more attention should be devoted to the post-natal period and the processes of involution and lactation. Unavoidable obstetric injuries should be adequately repaired, and every effort made to

prevent subinvolution and the development of displacements, which not only impair the pelvic musculature, but lead to defective uterine action in subsequent labours.

Under such a regime, the pathological phenomena of old age will become rare, but the old multipara will continue to bear children and to require the special attention of the midwife. Much can be done by simple conservative methods to mitigate the evil effects which have already been described; the exhibition of iron and calcium combined with a suitable aperient has a most favourable effect on the muscle tone, and it may usefully be combined with 0.5 c.cm. of pituitrin twice a day during the last week or so of pregnancy; this not only improves the tone of the uterus, but in many cases brings on labour, to the benefit of the patient. Uterine distortion and dislocation must be controlled, and the resulting malpresentations and malpositions corrected by manipulation or the application of padded binders. The induction of premature labour before or at term is a useful prophylactic measure for women who habitually produce big children; in this connexion it is well to remember that, from the functional point of view, the pelvis gets smaller as the patient grows older.

During labour the application of forceps or version in certain cases will relieve the efforts of the uterus and reduce the work of the myocardium, and the third stage must always be conducted with the greatest possible care. A good deal can be done by these conservative measures to reduce the maternal risk, but the obstetrician should not hesitate to employ more heroic treatment if he believes surgical intervention to be necessary. It may require a certain amount of moral courage to suggest operative delivery to a woman who has already been delivered many times *per vias naturales*, but a careful review of the situation will show the wisdom of such advice for carefully chosen cases; indeed, it is safe to predict that in a more advanced epoch the majority of 8-paras and all women of 40 will be delivered by Caesarean section.

REFERENCES.

- ¹ Menzies: London County Council, Annual Report of the Council, 1928, p. 15 et seq.
² Gordon Ley: Utero-placental (Accidental) Haemorrhage. *Journ. Obstet. and Gynaecol. of the British Empire*, 1921, vol. 28, p. 69.

The Morison Lectures

ON

NERVOUS SEMEIOLOGY, WITH SPECIAL
REFERENCE TO EPILEPSY.

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LECTURE II.—SYMPTOMS INDICATING INCREASE
OF NEURAL FUNCTION.

PASSING attention has already been directed to the general division of nervous symptoms, whatever their order, into those expressive of increase and decrease, respectively, of nervous function. The classification is applicable as well to those of the neuro-sympathetic system as of the psychical series. Possibly the term "increase" is not the most satisfactory that might be selected; it is taken to include symptoms and syndromes indicative of escape or release of function, in addition to such as presumably come into existence through stimulation or excitation.

Clinical experience affirms that an extremely large part of neural semeiology is included in this first main division, but the two sets are not mutually exclusive by any means; convulsions and paralysis can occur in the same subject, not, of course, simultaneously in the same part, yet in immediate sequence, while a limb already paralysed may become convulsed; the phenomenon of *anaesthesia dolorosa* is constituted by the synchronous combination of subjective pains or neuralgia referred to a region which is objectively

anaesthetic; involuntary flexor spasms can take place in paraplegic extremities that the patient cannot voluntarily innervate. Further, not a few of the semeiological concomitants of epileptic fits are substantially indicative of functional inhibition; and some varieties of seizure are considerably more inhibitory or akinetic than kinetic or excitatory. Thus the question may arise whether in point of fact any symptom group is not accompanied by evidence of both one and the other physiological actions; but this is probably true only of the higher levels of the nervous system, and in the special sense that if an excitatory process is to exteriorize itself it must succeed in overcoming inhibition. No escape-phenomena can accompany paralysis at the level of the lowest motor neurones, but the same affection of the highest almost inevitably entails the likelihood of release below. Whether inhibition is constantly present is doubtless matter for discussion; if I become conscious of the aching of a carious tooth it is always allowable to assert that inhibitory control must be in abeyance ere impulses from dental end-organs reach the cortex to give rise to (I do not say "to be changed into") sensations; yet of the actual existence of such a mechanism, still more of its intimate nature, we are likely to remain in considerable ignorance. As regards the general sensory system data suggesting the possibility of sensory inhibition have been marshalled recently by Foerster (*loc. cit.*), while in respect of the visual system some experimental work by Brouwer¹⁸ has seemed to prove the existence of an *efferent* system accompanying the optic tract from external geniculate to occipital cortex, conceivably inhibitory in function. Thus some basis is provided for the hypothesis; at any rate, we know that different functional levels of the nervous system enjoy comparatively independent life, and that those of higher are, as it were, protected against those of lower grade. When we speak of centres "representing" lower units in more complex ways and of their constituting also reservoirs of energy, we should not overlook the possibility of their having inhibitory functions too. Hughlings Jackson has somewhere spoken of these upper centres as forming "resisting positions"; owing thereto, activities of the highest levels can proceed without interference from the environment (the life of thought would be intolerable otherwise) on the one hand, and without effecting reactions on it on the other. It is matter of common knowledge that impulses from the periphery must in numerous instances never penetrate to the cortical level, being damped down or turned off and shunted to the efferent side through infra-cortical reflex arcs. Muscular tone maintains the subject's erect position by impulses derived from the sensory periphery and passing over a mesencephalo-spinal circuit of which he is completely unaware. Similar comment applies to the abundant activities of the neuro-sympathetic system; on rare occasions only are we consciously aware of them. Protection may be justifiably assumed in respect of cortical action; and in consequence thereof it is permissible to argue that symptoms whose character partakes of increase or release of neural function must break down resistance and neutralize inhibition ere they come into being. But with this proviso much in neurological semeiology consists essentially of "positive" symptoms, signifying enhanced or exalted activity on the part of the mechanisms involved.

We may now consider one or two specially selected aspects of the most obvious type of "positive" syndrome—namely, that described in semipopular phraseology as "attacks," "seizures," or "fits."

On various previous occasions I have dealt with one or other side of this subject, though not before in the fashion now to be adopted. Most neurologists are familiar with the Jacksonian conception of three physiological levels or grades in the central nervous system, spoken of by him as the highest, the middle, and the lowest respectively. Of these the first he took to have its anatomical substratum in the frontal lobes; the second or middle level corresponded to that part of the cortex where are situated the Rolandic centres; the lowest was ponto-bulbar in position. We need not follow Jacksonian conceptions slavishly in the present connexion, seeing that he himself was ever willing to discard unsubstantiated hypotheses; at the same time, and in spite of its schematic character, I shall for my present purpose utilize his theory in modified form; the highest