

The Birth of a Living and Healthy Child

AS A PROBLEM IN PREVENTIVE MEDICINE

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THAT the attainment of the birth of a living and healthy child is a problem facing our civilization today, can scarcely be denied. Also it seems that the attack on this problem must be made by that particular part of our organization which we call, preventive medicine; though this term should also include those allied arts of public education, sociology, eugenics and economics, as well as medicine.

Obviously in the prevention of foetal injury and death, the broad outlook must be adopted just as it is in considering sewerage disposal or other public health problems.

This prevention of death in the ante-natal period of life and the birth of a baby healthy enough to successfully fight through the dangers of the neo-natal period, and go on to further development, is today a department of preventive medicine offering peculiar attractions and opportunities. Such an ideal is fallen far short of, in many instances. To show that this is true, it is only necessary to point to the statistics of infant mortality both ante-natal and post-natal, of the present time. The ante-natal figures are of course, only approximate. However, Ballantyne says there are 19,000 still births annually in England and Wales. To these must be added the abortions and miscarriages. In other words, the still birth rate, is about 30-40 per 1000 living births. The miscarriage rate has been estimated as not less than 150 per 1000 conceptions. Putting these together the conclusion is reached that if one starts with 1200 conceptions, something like 200 of these lives are lost before pregnancy is ended and labor completed. Considering post-natal mortality figures, one finds that in most places the death rate exceeds 100 per 1000 living births. 40 to 45 per cent of these occur in the neo-natal period, i.e. during the first month. Most of these neo-natal deaths occur in unhealthy babies and many are preventible. Obviously there is a large field for life-saving endeavor among those ante and neo-natal deaths. One may answer, that this field has already been trodden and that all that can be hoped for has been attained. This is not so. Over the last 75-100 years, the general infant mortality rate has dropped remarkably but on closer investigation, we find that practically all the gain has been made in that period of the 2nd to the 12th months after birth. The edges of the field have been nibbled at, by the creation of pre-natal clinics and the, as yet rather unfruitful, attempt to make the profession and the public, pre-natally minded. Most of the attempts in this direction have been to the advantage of the mother, rather than the child. All the large though somewhat indefinite field of eugenics, has been entirely thrust aside or only mentioned to be condemned as the irreligious meanderings of a pagan people.

To the above picture of the needless death occurring, must also be added the numerous children born living into this world, but who do not become healthy individuals. The grosser forms of these are seen in the congenital deformities, the congenital idiots, etc. Besides these, we have the larger and more serious group of individuals who seem to possess an inherited constitutional tendency to disease, and constitutional physical and mental disabilities in general, who go on to become our neurotics, our chronic invalids, a burden to themselves and everyone else, except the patent medicine vendor.

At this point the question arises: is it worth while trying to do anything about this? The answer from an economical standpoint is perhaps, No. But turning to the medical aspect of the question, the answer cannot be in doubt. Since the days of Hippocrates, the ideal of medicine has been to save life. In recent times, emphasis has swung to the ideal of preventing dangers to life, i.e. disease. Possibly in the future the most important part of preventive medicine (preventive hygiene) will be found to consist in preventing, as far as possible, the conception and birth of human beings of inferior physical make-up, or of defective or anti-social mental qualities. The watchword of medicine of the present day is prevention; but prevention to be thoroughly effectual, must be ante-natal. The moment a child is born with a hereditary taint, prevention has, so to say, its hands tied. It is no longer prevention, it is palliation.

The next question that arises is—Is such an ideal possible, can such a goal be attained? The answer is definitely—Yes, to a very large degree! Here is an opportunity for preventive medicine to get in on the ground floor and effect a huge saving of life, illness and deformity; an opportunity where results only partial, but yet spectacular can be observed in the course of a few months and which will go on increasing through the years.

The reason for this answer is based on the consideration of three facts:

(1) Life does not begin at birth. Biologically speaking the vital processes begin from the moment when the sperm has penetrated the ovum and the multiplication of cells has begun. There is evidence, both experimental and clinical that the vital processes even at this early period, can be influenced by factors to some extent under our control. Preventive medicine like most other things, should begin at the beginning, if it is to do its greatest work. This work is simply a segment in a circle of preventive and curative means which goes to the saving of maternal, foetal and infantile lives to the amelioration of maternal suffering, and to the lessening of intra and neo-natal disease and deformity. Many examples can be quoted, e.g. the curing of a case of chorea gravidarum is of great value to the expectant mother, but of equal value to the foetus, for if not carried out, abortion may result with loss of embryonic or foetal life. Again, correction of malposition results in easier labor for the mother and may save a stillborn child or birth injury.

(2) The life and health of the foetus and new born child may be affected by factors operating long before conception has occurred. These also offer an opportunity for preventive medicine in its widest sense. Such

influences are particularly well seen in the life of the mother even back to her own infancy, e.g. rickets at such a time may lead to abnormalities of her pelvis, seriously endangering the life of the child. Again syphilis acquired by the husband long before marriage, may be responsible for a string of miscarriages and still births. Many examples could be mentioned some going back for generations.

(3) Other factors, community or state, rather than personal, as above, may affect the life or health of the foetus, or babe, e.g. the training of the attendant at confinement may be the difference between ultimate life and death for the baby. For these reasons, then, I believe that many lives could be saved and many weaklings prevented by the proper application of preventive medicine to the subject.

Assuming that the above generalizations are valid, how then may preventive medicine act to alleviate these conditions as far as possible? The following is an attempt to answer this question:

The chief causes of foetal or early infantile deaths or sickness, may be classified as follows:

- (1) Placental abnormalities, e.g., placental infraction, abnormal implantation, premature separation, etc.
- (2) Defective blood supply to the foetus, e.g. in placental diseases, particularly syphilis, toxemias of pregnancy, infectious diseases.
- (3) Injury during pregnancy, e.g. falls or blows on the abdomen.
- (4) Complications of labor, causing birth injuries, compression of cord, etc.
- (5) Foetal states, including congenital defects, e.g. hydrocephalus, congenital syphilis.
- (6) Prematurity: small, undeveloped organs are not prepared to function. For the same reason, birth trauma is not well withstood, so there are many still births in this group.
- (7) Post-natal causes.

Many of these causes can be prevented or their ill effects lessened, by the proper application of preventive measures. Thinking in terms of the child, there are two periods in which deleterious influences may act to later affect the life and health of the child, namely:

- (1) Ante-natally.
- (2) Intra-natally, i.e. in that short but dangerous period of actual delivery.

The ante-natal period may in turn be subdivided as follows:

- (a) Before conception has occurred.
- (b) During the actual act of conception.
- (c) After conception has occurred.

The intra-natal period also can be subdivided.

- (a) Ante-natal: preventive measures antenatally may insure a safe delivery.
- (b) Intra-natal (proper) i. e., during the actual delivery by good obstetrics.

Considering these time periods more fully, what measures may be taken in each and what results may be expected?

Ante-Natal Period:

(a) Ante-conceptual: The obvious points to be considered in this period may be summed up as: 1. Eugenics. 2. Parental Hygiene. 1. Eugenics: this subject was first conceived in the mind of Sir Francis Galton in the 19th Century, but did not come prominently into public notice till the first decade of the 20th Century. Since then it has been enthusiastically adopted by science, but the medical profession has been slower to receive it.

Eugenics is the science of the production of the best possible offspring, and states that those individuals who are best able to maintain themselves, and by their life and work are most helpful to the progress and happiness of their fellow human beings, are most fitted to have families.

But the tendency to antenatal death and disease may be latent in the germ plasm of one generation and come out, as it were, in the next. Thus it is sometimes rather difficult to say just who are fit and who are unfit for procreation, and unfit offspring will occasionally be born in families with excellent eugenic records.

Yet it is obviously by eugenics alone that the misfortune of being born with defective moral capacity as well as numerous bodily defects, can be avoided. Eugenics is one of Nature's secrets with which man has become acquainted; though he makes use of his knowledge in the breeding of animals rather than to help mankind and improve the health and capability of human beings.

2. **Parental Hygiene:** When one comes to the subject of parental hygiene, one is on much less controversial grounds. No one will deny the immense value of parents being as healthy as they can possibly be. Parental hygiene has for its object, the production of fertile and healthily fertile persons for parenthood, and includes all hygienic means which can be brought into action during the life of the father and mother up to and including the act of conception. It begins in infancy, is continued throughout childhood, through adolescence into adult life, and in the events of marriage and early married life.

Such attention is particularly desirable for the mother, and rickets is the shining example of the advantage of it. Such diseases as tuberculosis, cardiac and renal disease may also be of vast importance to the life of the future child.

The advantages of proper hygiene for the future father are less evident. It is assumed that the spermatozoa may be influenced by adverse circumstances in early life, resulting in depressed vitality or death for the offspring. Be that as it may, in the case of syphilis, it is certain that any measures, be they prophylactic, social reform or better treatment for adult males, will be of immense value for the health or lives of their children.

The subject of ante-conceptual hygiene should not be dismissed

without a consideration of several vague factors having to do with the birth of a living and healthy child. These might be called the social aspect of the question.

Certain facts are known as to the result. Dr. Alice Hamilton, of Chicago, has shown that the infant mortality in families of six children is $2\frac{1}{2}$ times greater than in families of four children. Mongolian idiots nearly always come at the end of large families. The words of Dr. Henry Ashby, (*Lancet*, Oct. 1, 1904,) are worth quoting in this respect:

"We often see a fully developed infant a day or two old brought to the out-patient department by a midwife or neighbor, very badly nourished, feeble and quite incapable of withstanding the conditions of external existence. There may be no question of syphilis, but simply the fact of coming from a poor, badly-nourished mother. These infants start life on a low level. Many weakly infants are born in our large cities who have a desperate struggle for existence, and finally succumb. They are largely the infants of weakly, poorly-nourished mothers, worn out by continuous child-bearing and who have been at work during pregnancy."

Preventive medicine might act in three ways to relieve such conditions:

- (1) The dissemination of proper conceptive information to these classes
- (2) The setting up of an economic order assuring them of sufficiency.
- (3) In some instances, sterilization.

Intra-Conceptional Prevention:

(b) All the factors involved in the successful performance of conception are not clear, but there can be no doubt of its profound importance and significance, for at this time a new life is brought into being, and the nearer to perfect the environment the better. At the present time sex physiology and sex psychology are practically unknown things to about 90% of our people. All aspects of marriage are provided for except procreation, which is usually the ultimate outcome.

There is a crying need for the teaching of sex physiology, psychology and ethics, and such could only result in healthier offspring if only due to the better satisfaction of the parents.

Post-Conceptional Measures:

These include all those things which we lump under the term, "Prenatal Care", namely; the supervision of the general health and obstetric condition of the expectant mother, with sympathetic guidance for her in her mental and emotional adjustment and instruction in her new duties, and responsibilities. Such a conception of the duties of a medical man is entirely a 20th Century viewpoint. Thus the modern doctor is no longer content with, at the best a perfunctory supervision of pregnancy, but realizes his responsibility starts as soon as he is consulted about the case, and does everything in his power to insure the normal delivery at full term, of a healthy baby. In the case of the mother of the poorer class, it should be the responsibility of the state to see that she has this care.

Every expectant mother has the right to this care when she is carrying in her womb and at her own risk, a future citizen of the state.

In order that every mother of the country shall have adequate pre-natal care, three things must be provided for:

(1) There must be some means of getting in touch with and gathering the expectant mothers together.

(2) There must be facilities for the continued medical supervision throughout the pregnancy. This must be met by the adequately trained family doctor for the women able to pay, and by the ante-natal clinic for the rest. Medical supervision in this period should include;

- (a) The diagnosis of pregnancy and calculation of the approximate date of confinement so the mother can make her preparations.
- (b) Supervision with a view of obviating as far as possible instrumental and manual manipulations, thus reducing foetal and neo-natal mortality.
- (c) Detection of diseases of heart, lungs and kidneys, with adequate treatment.
- (d) Diagnosis of syphilis if present with adequate treatment instituted immediately.
- (e) Detection and treatment of the earliest signs of toxemia.
- (f) Measurements of the pelvis; detection of the presence of pelvic tumors.
- (g) Diagnosis of position and presentation of the foetus.
- (h) X-Ray examination in doubtful cases.
- (i) Education of expectant mothers.

(3) There must be hospital beds available when necessary for the treatment of these cases.

(4) Provision must be made that the mother will not have to work in the later months of pregnancy, that she will be adequately nourished throughout pregnancy and that her mental outlook is as calm and contented as possible, e.g. she should be freed from the worry that her child will probably starve during the first year of its life.

Such an ante-natal system as outlined will do much to decrease foetal and neo-natal mortality and disease from a variety of causes. A few of these are so outstanding as to merit individual mention:

(1) Prematurity and congenital debility, these conditions go hand in hand, as prematurity, never exists without debility. About half of the infants dying during the first year, die in the first week. The greatest number of these deaths are due to prematurity. The prime causes of prematurity are, maternal syphilis, maternal malnutrition, and weakness coupled with the mother doing heavy work, and the toxemias of pregnancy. All these are preventable by early and adequate treatment.

(2) Chronic abortions and miscarriages: these are linked with the above and the same observations are true. However, if many of these cases of chronic abortions, where no organic cause can be found, are put to bed and receive good care, and treatment, many foetal lives will be saved.

(3) Syphilis: Syphilitic infections in utero, results in one of three things:

- (a) Abortion or premature birth
- (b) Still birth
- (c) Living child with congenital syphilis

At this point it must be urged that syphilis is not an hereditary disease. It is a transmitted infection from the husband to the wife and child. Prenatal treatment can do little for hereditary diseases, but an acquired disease such as syphilis can be satisfactorily treated.

(4) Birth injuries: these amount for a great many still births, and neo-natal deaths. They are usually the result of some abnormality of labor requiring operative interference. Many can be avoided by prenatal care.

Intra-Natal Period:

(a) Ante-natal prevention: it is merely necessary here to repeat what has been said before, that many intra-natal deaths may be prevented by complete ante-natal care.

(b) Intra-natal (proper) prevention: i.e. the saving of foetal life or injury during the short but dangerous time of actual labor and delivery.

As mentioned before, a good many of these deaths are due to causes which may be foreseen in the prenatal clinic, and either prevented entirely or at least guarded against. However, there is the other type of intra-natal danger that comes on the obstetrician unawares, when labor has already begun. This group is decreasing as pre-natal care and knowledge increases, but there are certain emergencies, e.g. prolapse of the cord which will always exist. For this class of case, the means which should always be available are in a sentence, *good obstetrics practiced by a reliable obstetrician preferably in a well equipped maternity hospital*. Preventive medicine comes into this picture in seeing that these conditions are provided. In this respect several points may be raised.

(1) Education of the medical profession. This is the most important consideration, without which the whole scheme breaks down. In the last analysis, it is the general practitioner and usually a busy one, who attends the great mass of obstetrical cases.

(2) Midwives: this question does not trouble us much in this country but in some places it is a live issue. The question arises, whether even a normal confinement should be managed by a midwife with no medical or surgical training. Certainly the ideal is that so uncertain a happening should have qualified attendants.

(3) Private homes: can confinement here be as safe as it is at the hospital? The answer is doubtful, but a Caesarean Section done in a case of disproportion early in labor may save a craniotomy later. At any rate, in caring for emergencies, the hospital is certainly far safer.

SUMMARY

1. An attempt has been made to show that many foetal and neo-natal lives are lost and many unhealthy babies born which might have been prevented by a proper application of preventive measures. The value of such saving is stressed.

2. These preventive measures must not include medicine alone, but also education of the profession and public and social and economic changes.

3. To be as effectual as possible prevention must not merely be confined to the mother after conception has occurred but must start as far back in the family tree as possible. Unfit stock must not reproduce.

4. Preventive measures which may be applied at different times, are outlined and their value pointed out.

5. No attempt has been made to write a text on prenatal care, practice of obstetrics, etc. These subjects have merely been sketchily touched.

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Forward Dalhousie

To the Editors and Staff of the Dalhousie Medical Journal:

The medical students are to be congratulated on their decision to produce a Journal. The matter apparently was fully discussed and the pros and cons carefully weighed in the balance before this action was taken. Good judgment is evidenced in not having attempted too much; three editions, I believe, will be issued each year.

The Journal should serve a useful purpose to the students of our medical school. It will also be a medium for the exchange of ideas between the under-graduates and those of other medical centres. Our graduates, particularly recent graduates who are holding important posts in recognized hospitals throughout Canada and the United States, could provide through the Journal most valuable information on post-graduate medical education.

Just a few words of advice. Keep your Journal essentially a students' product with well written, carefully thought out articles on medical and allied subjects. Make your best attempt to secure exchange articles on topics of common interest from medical students of other schools throughout the world. Let us hear from our recent graduates, those who have gone on to further study and those who have entered general practice, and perhaps an occasional article by members of our Faculty or the Faculty of Arts and Science.

You have got away to a good start. You will have difficulties to overcome, financial and otherwise. Maintain a high standard—remember your Journal carries the name of Dalhousie.

Sincerely,

H. G. GRANT,

Dean of Faculty of Medicine.