

A Survey of Breathing Exercises and Natural Childbirth Methods.

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At the turn of the century the opinion was held that the pregnant woman must breathe for two. For this reason she was advised to avoid stuffy atmospheres and move only in well-ventilated places. Good posture, linked with correct breathing, was considered essential for good health. Failure to follow these dicta would have meant that the pulmonary function of the expectant mother would have readily been rendered inadequate^{14, 17, 20, 24, 26}.

These ideas influenced the breathing exercises which have been taught by the childbirth preparation methods. They form a part of the curriculum of pre-natal classes and are intended to be of benefit both in pregnancy and labour. An outline of breathing exercises will be given in this article and the rationale for them considered. Physical exercises in the obstetric patient have been discussed elsewhere².

THE NATURAL CHILDBIRTH METHOD

Grantly Dick Read²⁴ prescribed breathing exercises during pregnancy as the basic essential for good health. He considered maternal oxygen intake to be dependent upon the correctness of this function. He stated that, with labour, "In the first stage respiration is naturally free and, as dilation progresses, increases in rate and depth. From 24 to 28 full breaths in a minute is normal at this time, followed by one or two deep breaths as the uterus relaxes . . ." He recommended that the patient pant with delivery of the head to help preserve the perineum.

English physiotherapists combined his ideas, with their own to produce the exercises taught by this method, and their use in labour is not very clearly described.

Heardman¹¹ elaborated on the use of deep breathing of the abdominal or diaphragmatic type. In this the abdominal wall is made to rise up with inspiration to permit maximum use of the diaphragm. This breathing is meant to be practised daily during pregnancy at varied speeds and depths and is to be utilised with labour contractions.

It is also to be combined with relaxation, for "To displace disturbing or worrying thoughts some positive idea must be given to the mind. Rhythm is a mental release, and the natural breathing rhythm serves the purpose".¹⁰

In addition, rapid "thoracic" type breathing with sternal elevation is suggested for use in late first stage. Rehearsal of bearing down is included in classes.

THE RUSSIAN PSYCHOPROPHYLACTIC METHOD

This method of painless childbirth originated in Russia in about 1950 and appears now to have waned⁶. Breathing exercises were incorporated into it as part of the pain-prevention technique in labour²⁷. When the pain became very intense, effleurage or abdominal stroking was added to these.

Deep, rhythmic respirations at the rate of 16 to 18 breaths per minute were suggested for use with contractions. The importance attached to this was twofold. Firstly, proper breathing could meet the increased oxygen requirement of uterine activity and improve the course of the contraction and eliminate distressing sensations. Secondly, the foetus was supposed to be favourably affected.

At the birth of the head, the patient was instructed to change from long straining to a short, rapid-type respiration.

THE FRENCH PSYCHOPROPHYLACTIC METHOD

Lamaze introduced this method into France in 1952¹⁴. He completely modified the breathing exercises and explained precisely what manoeuvres had to be done for each phase of labour.

The benefits derived from the exercises of the Lamaze method practised during pregnancy are supposed to be as follows. Firstly, the maternal oxygen requirements are increased, but the lordosis of pregnancy hampers ventilation and leads to fatigue, strain, and general trouble, which is overcome by exercise. Secondly, the patient is made conscious of the anatomical relation of organs directly or indirectly connected with parturition. This gives her better control over her diaphragm in labour. Thirdly, it is physical training for an event with a physical aspect.

In labour, psychoprophylaxis patients are cautioned to breathe both in a shallow and fast manner from the time when they have attained approximately 3 cms. of dilation until the second stage is reached. They are trained to punctuate their breathing patterns with blows to overcome any premature urge to bear down. The second stage is rehearsed with gentle pushing efforts and panting for delivery of the head. Vellay²⁸ believed that with training, women in the future would produce strenuous efforts whilst breathing. Most psychoprophylactic method authors advocated the use of supplementary oxygen in late labour.

The importance attached to correct breathing in labour by psychoprophylaxis has two aspects.^{14, 26} Firstly, the increased maternal and foetal oxygen demands of labour are met with by fast breathing (and not slow). The responsibility to ensure good oxygenation falls mostly on the mother, and if her respiratory response is inadequate, both she and her baby could be adversely affected.

Secondly, shallow breathing prevents irritation of the uterus as this organ is thought to feel every bit of pressure increase, but the significance of this statement is never explained. The way to avoid this apparently undesirable state is to relax the abdominal and pelvic-floor muscles as well as to exert control over the diaphragm. The diaphragm is credited with a piston-like pushing action, and thus its movement must be minimised by the application of shallow breathing.

PATIENT REACTION

Patients and midwives have been questioned about the value of breathing exercises performed in labour and a diversity of views have emerged. However, adequate questionnaire study and evaluation have still to be completed on this aspect.

Many consider them to be a good distraction, and provide something on which to concentrate⁹. Others find them helpful, particularly in the early stages of labour. Some patients discover that in late labour they are difficult to perform or are of no assistance^{4, 10}.

Certain midwives have commented on the Lamaze type of breathing. Some find that the patients can become very tired from its performance and also emotionally distressed if they are unable to remember the details to follow all their instructions. The frequency of these occurrences is unknown.

The majority of trained patients co-operate well during the second stage and can push or restrain themselves as requested.

DISCUSSION

Many of the breathing exercises, and the purposes given for their practice, are common to the different methods. The major variation between methods occurs in the recommended rates of respiration³.

Three main issues are raised by the childbirth methods and their use of breathing exercises in pregnancy and labour. Firstly, the physiological question is posed about the adequacy of maternal oxygen uptake and the subsequent transfer to the foetus. Secondly, importance is attached to the patient's knowledge and control of her anatomical mechanisms of breathing. Thirdly, the psychological values and effects merit consideration.

(a) Physiological Considerations

Pregnancy gives rise to an increased ventilatory demand which the woman meets with a "physiological hyperventilation"^{18, 23}. Cugell *et al* (1953)⁷ studied pulmonary function in pregnant women and found no defect in gaseous distribution. In another study, only patients with very severe respiratory disease did not produce the associated respiratory changes of pregnancy¹⁹. Another survey showed that certain severe scoliotic patients could cope with pregnancy without the development of cardio-respiratory complications¹⁹.

Respiratory ventilation studies in labour are scanty, but information has recently emerged about normal patients. Some of the aspects of maternal gas exchange have been measured and have not demonstrated any ill effects to the foetus from spontaneous maternal respiration^{15, 25}.

Supplementary oxygen can be transferred from the mother to the foetus, but this depends on the concentration and method of administration^{9, 22}. However, the indications for oxygen administration, the optimum concentration required, and the circumstances under which benefits can accrue, have still to be more fully assessed.

(b) Anatomical Mechanisms

The mechanisms of respiration as described by the childbirth methods are open to doubt.

Two types of breathing are traditionally described. There are the abdominal or diaphragmatic form and the thoracic type. This classification is debatable and stems from observations made in the Victorian era. Women wore tightly laced stays and were unable to move their abdomens, thus

their respiratory movements were only visible in the thorax. This was classified as thoracic breathing. However men, unhampered by wearing apparel, moved their abdomens freely with respiration^{18, 20}. Kellogg (1902)¹² studied the body movements of respiration and presented pneumographic tracings of two male and five female subjects (Fig. 1). One female subject was an habitual corset-wearer, and one male wore a corset for the purpose of the experiment. He recorded expansion over the thorax and abdomen and showed that abdominal movement predominated over thoracic, except in the corset-wearers, where the reverse occurred.

Combined radiological and spirometric studies have been performed in relation to movements of the chest and diaphragm²⁸. Wade (1954)²⁰ concluded that there is a close co-ordination between the movements of the diaphragm and the chest. He found no evidence that a person can have direct voluntary control over the diaphragm, but trained subjects could inhibit changes in chest expansion.

The direct relationship of abdominal movement as a reflection of diaphragmatic movement can be queried. Measurements were taken of the vital capacity of physiotherapy students with normal chest movement. These were compared with the capacity found in the same students when they attempted diaphragmatic breathing. A 25 per cent reduction was found with the latter type of respiration³⁰.

THE DIAPHRAGM AND INTRA-ABDOMINAL PRESSURE

The action of the diaphragm in respiration is thought by the French psychoprophylactic school to increase intra-abdominal pressure. For this reason they recommend shallow respiration in first-stage labour. This concern with the danger of pressure increase might stem from the possibility of production of cervical oedema in first-stage labour when bearing down (i.e. a state of increased intra-abdominal pressure) occurs.

Measurements of intra-uterine pressures were recorded during the labours of over 300 women. These were mainly untrained patients who did not try to regulate their breathing patterns or mechanisms. Changes due to respiration were rarely observed. In a few cases respiratory deflections appeared in patients who snored, but they were of an insignificant order of magnitude²¹.

Measurements of intra-abdominal pressures taken in healthy males during normal breathing showed little variation (3-5 cms. water). With hyperventilation, the pressure changes rarely exceeded 10 cms. water at the upper limits⁶.

The role of the diaphragm in bearing down is primarily one of fixation of the thorax when the glottis is closed and the intra-abdominal pressure is increased. The piston-like pushing action attributed to it could be incorrect¹.

(c) Psychological Consideration

The psychological aspects, as yet, are almost unexplored, but on preliminary survey both favourable and undesirable effects emerge.

The performance of breathing exercises gives the patient something to concentrate on and occupy herself with in labour⁹. Distraction—in this instance breathing exercise—apparently can elevate the pain threshold to a limited extent. If the pain intensity increases far beyond this elevated threshold, the patient may then find them of no further assistance.

Difficulty in performing breathing exercises in labour can occur for two reasons. Firstly, the patient might be in severe pain and/or drugged. Secondly, some of the exercises are unrelated to spontaneous respiratory rhythms which occur in labour, and this can create problems in their execution³. Inability to carry out these exercises as instructed can occasionally cause the patient distress, but this depends on the personalities of patient and teacher.

CONCLUSION

The ventilatory response of the normal woman to pregnancy appears to be adequate. Breathing exercises are thus unlikely to improve gaseous exchange or prevent ill health.

The division of breathing into abdominal and thoracic types appears to be based on trick movements. The diaphragm and the thorax largely co-ordinate their action, and direct voluntary control of the former cannot be realistically achieved. Instruction in trick movement may cause confusion and upset to the patient in labour.

In normal spontaneous respiration, the movement of the diaphragm does not increase intra-abdominal or intra-uterine pressure to a level which can irritate the uterus. The diaphragm is a fixative muscle, and this function is utilised in bearing down.

Needless responsibility is placed on the patient if she is taught to perform precise respiratory actions in labour for unproven benefits to the baby and herself. If any problems arise in labour, the treatment and correction of these depend on the obstetrician and not on the patient.

Nevertheless, if the patient concentrates on her natural respiratory rhythm in labour, as proposed by Read, this can be of variable assistance. It is a good distractive measure and keeps the woman occupied. Patients should be told that in early labour they will find themselves breathing slowly, and in later labour they might breathe much faster with their contractions. They should be cautioned that this might not be of help in late labour, but safe modern drugs can then assist them.

Training can increase the ability of the patient to co-operate with bearing down in second stage and to pant to the negative command of "Don't push".

SUMMARY

Some of the reasons given by childbirth preparation methods for the use of breathing exercises in pregnancy and labour are in doubt; the patient can be taught to concentrate on her natural respiratory rhythm in labour, and should do this only when she finds it to be a helpful distraction and occupation.

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REFERENCES

1. Blankfield, A. (1965). *Med. J. Aust.* 2, 666.
2. Idem (1967). *Med. J. Aust.*, 1, 163.
3. Idem (1969). *Aus. and New Z. J. Obst. Gynaec.*, 9, 118.
4. Buxton, R. St.J. (1965). *Nursing Mirror*, June 18.

5. Campbell, E. J. M. and Green, J. H. (1953). *J. Physiol.*, 122, 282.
6. Chertok, L. (1967). *Am. J. Obst. Gynaec.*, 98, 698.
7. Cugell, D. W., Frank, N. R., Gaensler, E. A. and Badger, T. L. (1953). *Am. Rev. Tuberc.*, 67, 568.
8. Davey, D. A., Du Toit, H. J., Farrel, A. G. W., Rorke, M. and Trezise, R. (1967). *Proc. Fifth World Congress of Obstetrics and Gynaecology*, Butterworths, Australia.
9. Earn, A. A. (1962). *Am. J. Obst. Gynaec.*, 83, 29.
10. Heardman, H. (1948). *A Way to Natural Childbirth*, E. & S. Livingstone, Edinburgh.
11. Idem (1951). *Physiotherapy in Obstetrics and Gynaecology*, E. & S. Livingstone, Edinburgh.
12. Kellogg, J. H. (1902). *Ladies' Guide in Health and Disease*, Pacific Press, London.
13. Ker, Alice (1891). *Motherhood: A Book for Every Woman*, John Heywood, London.
14. Lamaze, F. (1958). *Painless Childbirth* (Part 3), Burke, London.
15. Lumley, J., Renou, P., Newman, W. and Wood, C. *Am. J. Obst. Gynaec.*, 103, 847.
16. MacRae, D. J. and Palavradji, D. (1967). *J. Obst. Gynaec. Brit. Comm.*, 74, 11.
17. McKenzie, W. C. (1928). *Brit. med. J.* 2, 534.
18. Manning, C. W., Prime, F. J. and Zorab, P. A. (1967). *Lancet*, ii, 792.
19. Midwives Questionnaire: unpublished data.
20. Morris, M. (1936). *Maternity and Post-operative Exercises*. Wm. Heinemann, London.
21. Newman, W. (1968): personal communication.
22. Newman, W., McKinnon, L., Phillips, L., Patterson, P. and Wood, C. (1967). *Am. J. Obst. Gynaec.*, 99, 61.
23. Novy, M. J. and Miles, J. E. (1967). *Am. J. Obst. Gynaec.*, 99, 1024.
24. Read, G. D. (1963). *Childbirth Without Fear* (4th edition, revised). Wm. Heinemann, London.
25. Reid, D. H. S. (1967). *Lancet*, i, 782.
26. Vellay, P., (1963). *Childbirth Without Pain* (2nd impression), Hutchinson of London with Allen and Unwin.
27. Velvovsky, I., Platinov, K., Ploticher, V. and Shugom, E. (1960). *Painless Childbirth through Psychoprophylaxis*, Foreign Languages Publishing House, Moscow.
28. Wade, O. L. and Gilson, J. C. (1951). *Thorax*, 6, 103.
29. Wade, O. L. (1954). *J. Physiol.*, 124, 193.
30. Wines, B., Nicol, L., Nicolson, R., Court, D. and Korsch, H. (1967). *Aust. J. Physiother.*, 13, 72.

13th February, 1970.

The Editor,

Thank you for asking me for my appraisal of Dr. Adele Blankfield's article on "A Survey of Breathing Exercises and Natural Childbirth Methods", which appeared in the *Journal* of the Chartered Society of Physiotherapy in August, 1969.

June, 1970

PHYSIOTHERAPY

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I have read this article carefully and agree with it entirely. I firmly believe that the pulmonary ventilation of the normal pregnant woman is adequately served by normal spontaneous breathing and cannot accept that any special patterns of breathing will really improve on this state of affairs.

The only possible advantage, that might accrue to the pregnant woman who has received special breathing exercises, is a psychological one. It may give her something to concentrate on in early labour and this may give her the feeling that she can do something active "to help" during the first stage of labour. Conversely, this may result in a feeling of guilt towards her baby if in the later stages of labour she finds herself unable to maintain the pattern of breathing that she has been taught.

In the second stage I agree that training does increase the ability of the patient to co-operate with bearing down

efforts—especially at the point of crowning of the foetal head.

In my opinion Dr. Blankfield's article is a well balanced and clear assessment of the subject of breathing in pregnancy and labour. It is an article that must be welcomed and is long overdue. It will help clarify a field that has, in recent years, become clouded and confused with unscientific methods and claims bordering on witchcraft.

I am,

Yours sincerely,

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