

Anal sphincter rupture during delivery: philosophy of science and clinical practice

The discussion about the use of perineal support to avoid anal sphincter rupture during delivery centres largely on one fundamental philosophical question: What is required to establish that there is a causal relationship between something we do (perineal support) and something we observe in retrospect (incidence of anal sphincter trauma)?

Atle Fretheim

atle.fretheim@kunnskapssenteret.no

Global Health Unit

Norwegian Knowledge Centre for the Health

Services

and

Institute of Health and Society

University of Oslo

Sometimes, the relationship between cause and effect is so logical or so obvious that it is barely debated. If a person is bleeding to death, logic dictates that the bleeding must be stopped. The effect of morphine on patients with severe pain is not doubted by those who have seen the effect a few times. But these are the exceptions. As a rule, the effects of what we do are by no means so obvious. One relevant example is the use of perineal support to prevent serious tearing during delivery (anal sphincter rupture) (1).

Dramatic decline in Norway – why?

The figures from the Medical Birth Registry of Norway are very encouraging: In 2004, when the frequency of sphincter trauma was at its highest, anal sphincter rupture was recorded in 4.1 % of all those who had vaginal deliveries in Norway (1). Since then this percentage has been reduced to 2.1 % – i.e. halved. There has also been a certain decline in the percentage of ruptures in Sweden since 2004, while an increase has been recorded in Denmark (2). The big question is: What is the cause of the huge decline in Norway? There is much to indicate that the use of perineal support has increased during the same period. Is this an essential part of the explanation? The answers to these questions are very important because birth attendants throughout the world are looking desperately for means of preventing sphincter trauma.

There is no broad international agreement on how birth attendants should use their hands during a delivery. For example, the British national guidelines state that «Either the 'hands on' (guarding the perineum and flexing the baby's head) or the 'hands poised' (with hands off the perineum

and baby's head but in readiness) technique can be used to facilitate spontaneous birth» (3). This recommendation is based on a systematic review of relevant research findings and also tallies well with the conclusions of other systematic reviews in this field: The benefit of perineal support for preventing sphincter trauma is uncertain (4–6).

Norwegian National Action Plan against Sphincter Trauma

In 2006, the Norwegian National Council on Maternity Care launched an action plan for preventing sphincter trauma (7). In the list of measures, strong emphasis was placed on delivery technique: «The most important here are the support techniques, but better cooperation between the woman giving birth and the birth attendant is also important» (7). As a basis for this recommendation, reference was made to a study from the 1990s which documented that the frequency of sphincter rupture was many times higher at a hospital in Malmö, Sweden, than at a hospital in Turku, Finland (8). The authors assumed that the difference was due to the use of different delivery techniques. It is not clear how the council evaluated the evidence for the use of perineal support. No reference was made to any research other than the aforementioned Finnish study, despite the fact that there were results available from experimental studies which did not substantiate the assumption that support techniques have a protective effect on the perineum.

Another important component of the action plan was to conduct «an intervention study to reduce sphincter trauma at five maternity institutions in Norway to examine the effect of such a measure». The intention was presumably to contribute more and better knowledge about the effect of perineal support, even if the «intervention» also included other elements, such as good communication between the woman giving birth and the birth attendant.

As there was little evidence to back the use of perineal support when the action plan was drawn up, it was in principle correct and important to plan a thorough evaluation.

Interpretation of the Norwegian intervention studies

The results of the intervention study at the first hospital were published in 2008 and those from the four other hospitals in 2010 (9, 10). The incidence of sphincter trauma in the three-year period prior to the introduction of the action programme was compared with the incidence in the subsequent three-year period. Thus there was no control group, nor was allowance made in the analysis for the fact that the incidence of sphincter trauma was already declining before the intervention was introduced. This type of uncontrolled before-and-after comparison has obvious weaknesses, and little weight is therefore attached to them as a rule. A new drug would never be granted marketing authorisation on the basis of such an evaluation. Systematic reviews of the effects of interventions (e.g. Cochrane reviews) very seldom include this type of study. The risk of biased results is simply considered too high. This does not mean that the results of such evaluations are necessarily misleading, but they may be.

All the hospitals reported dramatic changes associated with the intervention programme. A decline in the incidence of sphincter trauma of 60–80 % (from about 5 % to 1–2 %) was reported. Few preventive measures in the health services are anywhere near so effective. Whether the observed decline was an effect of the programme – and the use of perineal support – or was due to weaknesses in the evaluation method, is hard to say.

Decline in sphincter ruptures in other maternity departments

One important source of error in uncontrolled before-and-after comparisons is that factors other than the intervention in question may have caused all or parts of the observed change. The reason for using a control group is precisely to try and avoid this source of error. Figures from the Medical Birth Registry show that from 2004 and up to the present, the majority of large maternity departments in Norway have succeeded in reducing the incidence of

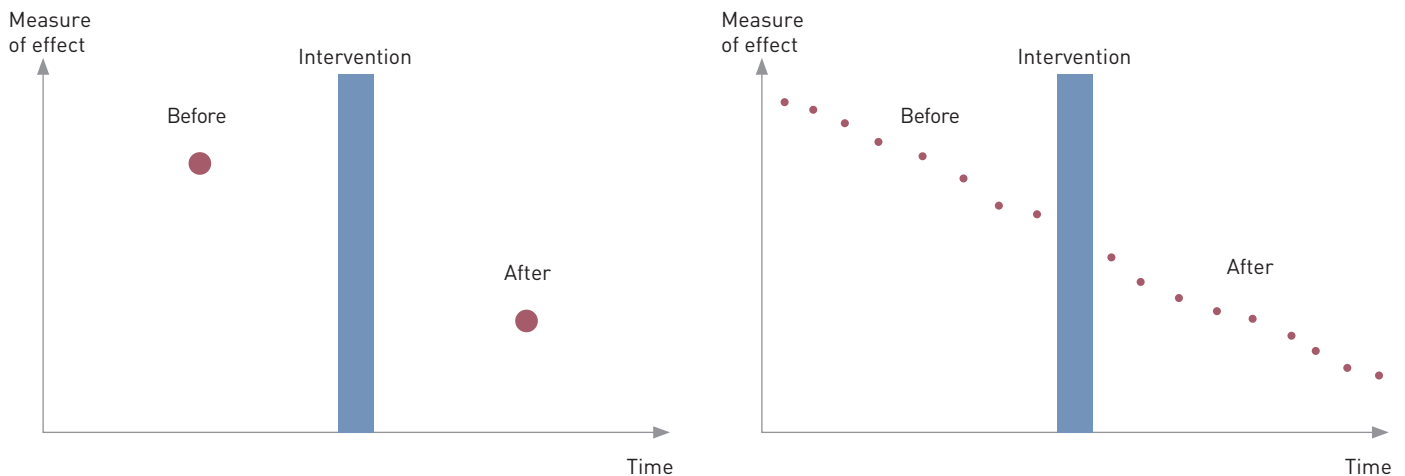


Figure 1 Before-and-after comparison with and without adjustment for time trends (theoretical example)

ruptures by 30–60%. This is a strong indication that factors other than the intervention programme have contributed to the decline in sphincter trauma, also at the intervention hospitals. This must be taken into account in the evaluation of the results of the intervention studies.

Another potentially important source of error associated with before-and-after comparisons is that underlying trends are not taken into account (Fig. 1). This is a major problem in the analyses of the intervention studies, since the rupture frequency was falling before the programmes were initiated. More thorough analyses where time trends are accounted for can adjust for this.

Preferably, the evaluation should have been carried out by randomising all maternity departments in Norway (and in Sweden and Denmark as well) to implementation of the programme in question, or not. The results of such an evaluation would have contributed important and robust data – for the benefit of women giving birth all over the world.

That said, the decline in sphincter trauma at the intervention hospitals was enormous. It may therefore be reasonable to interpret the results as indicating that the intervention programme probably had an effect, even though the size of the effect is highly uncertain. It is very difficult to say which component of the programme contributed most to the observed change. It is possible that increased use of perineal support was the deciding factor, or it may be that other factors had far greater influence on the

result – for example, improved communication between the midwives and the birthing mothers or increased use of episiotomy.

Other relevant knowledge

The results of the Norwegian evaluations must also be viewed in relation to other research. Where good, randomised, controlled studies exist, strong weight will in most cases be attached to these. A Cochrane review of interventions to protect the perineum identified three major experimental studies on the use of manual support measures (4). One of these seems particularly relevant to the Norwegian debate, namely a Swedish study published in 2008 (11).

In order to test the hypothesis that the Finnish manual support tradition leads to less sphincter trauma, birthing women at two Swedish hospitals were randomised to receiving either perineal support in the Finnish manner ('modified Ritgen's manoeuvre') or the type of perineal support that was 'standard care' at the hospitals. There were no fewer cases of sphincter trauma among the women who received 'Finnish' perineal support.

The results of the Swedish study are in strong contrast to the Norwegian results. One possible explanation may be that the Swedes placed emphasis exclusively on which manual manoeuvre was chosen, whereas the Norwegian intervention consisted of several components. In other words, the use or choice of a specific manual manoeuvre may be of limited importance. Another explanation may be that the Swe-

dish midwives received poorer training in the use of the 'Finnish manoeuvre' than the Norwegians did. A third may be weaknesses in the Swedish study – for example it is not clear why only half of birthing women took part. A fourth possibility is that the Swedes used a manual technique that differed somewhat from the one used in Norway. It is difficult to say whether explanations of this nature or sources of error in the Norwegian studies are the reason for the very different results. The results from other experimental studies also indicate that support techniques do not affect the rupture incidence.

Manual manoeuvre or not?

All evaluations of causal relationships (e.g. whether perineal support provides protection against sphincter injury) imply an element of judgement. Is the documentation sufficiently convincing? We expect a high degree of agreement among professionals when the evidence is solid and clear and less agreement when it is not. In light of the unclear evidence it is not surprising that there are different views as to whether perineal support should be used as a matter of routine – and, not least, what sort of manoeuvre should be used in the event.

Determining the importance of manual support techniques for preventing sphincter trauma should be given high priority by both professional bodies and the health authorities. If a robust evaluation shows that the use of perineal support actually halves the incidence of sphincter trauma,

this could influence practice at birthing centres worldwide and result in hundreds of thousands of women avoiding this complication.

Atle Fretheim (born 1968)

Heads the Global Health Unit at the National Knowledge Centre for the Health Services and is an associate professor at the Institute of Health and Society, University of Oslo. He has been researching the effects of health service programmes for 13 years.

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References

1. Staff A, Laine K. Mange sfinkterskader kan forebygges. Tidsskr Nor Legeforen 2012; 132: 2364–5.
2. Laine K, Rotvold W, Staff AC. Are obstetric anal sphincter ruptures preventable?—Large and consistent rupture rate variations between the Nordic countries and between delivery units in Norway. Acta Obstet Gynecol Scand 2012. E-publisert 4.10.
3. Intrapartum care care of healthy women and their babies during childbirth. Clinical guideline. London: Royal College of Obstetricians and Gynaecologists, 2007.
4. Aasheim V, Nilsen AB, Lukasse M et al. Perineal techniques during the second stage of labour for reducing perineal trauma. Cochrane Database Syst Rev 2011; nr. 12: CD006672.
5. Eason E, Labrecque M, Wells G et al. Preventing perineal trauma during childbirth: a systematic review. Obstet Gynecol 2000; 95: 464–71.
6. Renfrew MJ, Hannah W, Albers L et al. Practices that minimize trauma to the genital tract in childbirth: a systematic review of the literature. Birth 1998; 25: 143–60.
7. Nasjonalt råd for fødselsomsorg. Sfinkterskader ved fødsel bør reduseres i Norge. Nasjonal handlingsplan. Oslo: Sosial- og helsedirektoratet, 2006.
8. Pirhonen JP, Grenman SE, Haadem K et al. Frequency of anal sphincter rupture at delivery in Sweden and Finland—result of difference in manual help to the baby's head. Acta Obstet Gynecol Scand 1998; 77: 974–7.
9. Hals E, Øian P, Pirhonen T et al. A multicenter interventional program to reduce the incidence of anal sphincter tears. Obstet Gynecol 2010; 116: 901–8.
10. Laine K, Pirhonen T, Rolland R et al. Decreasing the incidence of anal sphincter tears during delivery. Obstet Gynecol 2008; 111: 1053–7.
11. Jönsson ER, Elfaghi I, Rydhström H et al. Modified Ritgen's maneuver for anal sphincter injury at delivery: a randomized controlled trial. Obstet Gynecol 2008; 112: 212–7.

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