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Review

Do maternal pushing techniques during labour affect obstetric or neonatal outcomes?

Le type de poussée maternelle pendant le travail a-t-il un impact sur les issues obstétricales ou néonatales ?

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ABSTRACT

Objectives. – To assess, through a literature review, the maternal and neonatal morbidity associated with the type of pushing used during the second stage of labour.

Methods. – We searched the Cochrane Library and the Medline database for randomised controlled trials from 1980 to 2015, using the following keywords: “delivery”, “birth”, “birthing”, “bearing down, coached, uncoached, pushing”, “second and stage and labour”, “randomised controlled trials” and “meta-analysis”.

Results. – Seven randomised controlled trials were found. Interventions varied between the studies. In the intervention groups, open-glottis pushing was spontaneous or coached. The groups did not differ for perineal injuries, episiotomies or type of birth. Impact on pelvic floor structure varied between the studies. Only one study found a better 5-minute Apgar score and a better umbilical artery pH in the “open glottis” group.

Conclusion. – The low methodological quality of the studies and the differences between the protocols do not justify a recommendation of a particular pushing technique. Further studies appear necessary to study outcomes with each of these techniques.

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RÉSUMÉ

Objectifs. – Évaluer, par une revue de la littérature, la morbidité maternelle et néonatale liée aux différents types de poussées lors du 2^e stade du travail (glotte ouverte ou fermée).

Méthodes. – Nous avons recherché les essais randomisés publiés entre 1980 à 2015, en utilisant la banque de données de Medline, avec les mots clés suivants : « delivery », « birth », « birthing », « bearing down, coached, uncoached, pushing », « second and stage and labour », « randomised controlled trials » et « meta-analysis ».

Résultats. – Sept essais cliniques randomisés ont été retrouvés. Le type de poussée différait selon les études. La poussée en expiration pouvait être soit spontanée, soit dirigée. Il n'y avait pas de différence entre les deux groupes concernant la survenue de déchirures, d'une épisiotomie ou le mode d'accouchement. L'impact sur la statique pelvienne variait selon les auteurs. Seule une étude a retrouvé un meilleur Apgar à 5 minutes et un meilleur pH artériel dans le groupe « glotte ouverte ».

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Conclusion. – La faible qualité méthodologique des études et leurs différences ne permettent pas de recommander un type particulier de poussée. D'autres études semblent nécessaires afin d'étudier les issues maternelles et néonatales avec chaque type de poussée.

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1. Introduction

Practices concerning childbirth have evolved considerably in recent centuries. Until the 17th century, births traditionally took place at home with an attendant who had little or no training [1]. Later, childbirth slowly became more and more medicalised; practices for the management of parturients during labour and childbirth today are very different than they were. Since the end of the 20th century, however, the medicalisation of childbirth has come under increasing challenge. A school of thought promoting a return to so-called "natural childbirth", which is less medicalised, has grown. In some countries, even some professionals doubt, among other things, the dogma of the dorsal decubitus position and the appropriate type of pushing during the second stage of labour.

Closed-glottis pushing, also called "Valsalva", is widely used in Western countries, but the origin of this obstetric practice is obscure. Pushing while exhaling was nonetheless described in obstetrical treatises until the end of the 19th century [2,3]. Valsalva pushing probably developed with the dissemination of forceps births, but without any convincing scientific data to support it.

There are currently no French guidelines for the management of normal childbirth. These depend on the training and beliefs of each obstetrician, general practitioner and midwife as well as on the policies in each obstetrics department. Today, the customers, so to speak, of obstetrics care demand less medicalisation and more involvement in the decision-making concerning their children's births. Professionals must therefore provide their patients with the best possible care according to up-to-date scientific data as well as inform them of the different alternatives for care. In this context, an analysis of the risks and benefits of the type of pushing during the second stage of labour is useful.

The principal objective of this work was to assess, through a critical analysis of the literature, maternal morbidity according to type of pushing (open or closed glottis) during the second stage of labour. Similarly, the secondary objective was to assess the neonatal morbidity associated with these two types of pushing.

2. Methods

2.1. Definition of types of pushing during the second stage of labour

In closed-glottis pushing, the woman is asked to inhale completely and fill her lungs completely with air, to hold her breath, and to push downward very strongly during contractions, for as long as possible, normally three times for each contraction. In French practice, this type of pushing is often directed, or coached. Many French professionals consider it the reference technique for pushing. Anyone who has been in a French delivery room has heard this advice: "Inhale deeply, hold your breath, and push for as long as you can!" There is nonetheless another type of pushing used less often by professionals: called open-glottis pushing, it occurs while exhaling (and can be coached or spontaneous). In France, open-glottis pushing is not frequently used, although it is a spontaneous, physiological, and sometimes overwhelmingly urgent way of pushing among parturients, especially those without epidural analgesia (so called Ferguson's reflex).

2.2. Databases searched

We searched the Cochrane Library, which includes 6 databases (Pregnancy and Childbirth Group's Trials Register, Cochrane Database of Systematic Reviews, etc.), and the *Medline* database to identify all randomised trials on this topic. This research was completed manually by studying the references of articles and book chapters published on this subject. The following keywords were used: "delivery", "birth", "birthing", "bearing down", "coached", "uncoached", "pushing", "second and stage and labour", and "randomised controlled trials" or "meta-analyses". We looked at English and French articles published between 1980 and the end of February, 2016.

Articles were retained for more detailed assessment when they described randomised clinical trials comparing the two types of pushing (open- or closed-glottis), including those comparing pushing coached by a professional to pushing without professional coaching during the second stage of labour.

The outcome measures considered were the following:

- for the mother: episiotomy, perineal lacerations, especially third and fourth degree, type of birth (spontaneous or not), and delayed damage to pelvic floor function;
- for the child: 5-minute Apgar score, cord artery pH, and need for resuscitation in the delivery room or admission to the neonatal intensive care unit (NICU).

2.3. Methodological quality assessment

The methodological quality of the studies was assessed independently by two of the authors, according to the recommendations of Chalmers et al. [4]. In particular, we looked for four factors creating a risk of bias: selection bias (inadequate random sequence generation and allocation concealment, subjects excluded after randomisation, or large numbers of women lost to follow-up), performance, attrition and detection bias. We also researched differences in co-interventions, apart from pushing.

3. Results

Two meta-analyses [5,6] and seven single-centre, randomised trials reported in nine articles, were identified [7–15]. Neither participants nor personnel can be blinded to the intervention we consider here.

Neither of the two meta-analyses compared exclusively directed open-glottis with directed closed-glottis breathing, although directed pushing is the usual practice in France. The meta-analysis of Prins et al., published in 2011, compared instructed closed-glottis pushing only with spontaneous pushing, although as we have underlined, in view of the lack of spontaneous practices in France, this was not the focus of our work. Moreover, the total number of cases was quite low for a meta-analysis (three studies, $n = 425$) [9,11,12,16], and it was limited to primiparous women without epidural analgesia [5]. The authors concluded that Valsalva type pushing should not be routinely recommended because it could have a deleterious effect on pelvic floor function.

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