

Epidural analgesia can sometimes abnormally prolong the second stage of labour

U. Indraccolo¹, A. Bifarini², R. Di Iorio³, M. Bonito⁴, S.R. Indraccolo²

¹Complex Operative Unit of Obstetrics and Gynecology, "Alto Tevere" Hospital of Città di Castello, ASL 1 Umbria, Città di Castello

²Department of Gynecological, Obstetrical, and Urological Sciences; "Sapienza" University of Rome, Rome

³Department of Surgical and Clinical Sciences and Translational Medicine "Sapienza" University of Rome, Rome

⁴Department of Obstetrics and Gynecology, San Pietro Fatebenefratelli Hospital, Rome (Italy)

Summary

Aim: Investigating if some factors associated with length of the second stage of labour are the same among normal labouring women with or without epidural analgesia. **Materials and Methods.** On a sample of 92 women, a correspondence analysis among factor associated with a long lasting second stage of labour and interventions for accelerate birth was built. The length of the second stage of labour was corrected in case of epidural or non-epidural analgesia, because epidural analgesia can normally prolong the second stage of labour. **Results.** Epidural analgesia is associated to both a normal course of the second stage of labour (between 25th and 75th centiles) and with a long lasting second stage of labour (> 90th centile). Even Kristeller maneuvers and oxytocin infusion are associated both to the > 90th centiles and to the 25th and 75th centiles, and to the 75th and 90th centiles ranges of length. **Conclusions.** Epidural analgesia can sometimes cause an abnormal prolongation of the second stage of labour, justifying some obstetrical interventions to shorten it.

Key words: Epidural analgesia; Labour; Complications.

Introduction

Epidural analgesia for pain relief in labouring women is recommended for treating pain and preventing birth fear and bad birth experience [1-3]. However, epidural analgesia can cause an increase in the second stage of labour [4-6], perhaps in relationship with mode of execution, drugs used, and obstetrical care. Obstetricians are aware that a long lasting second stage of labour may be harmful for the baby, thereby they are forced to intervene to shortening it, even in case of epidural analgesia. This kind of policy leads to increased operative vaginal birth or other interventions for shortening labour; however how long is the second stage of labour too long? In a recent report, Leveno *et al.* [7] reported that the higher limit of length of the second stage of labour should be fixed to three hours in multiparas with epidural analgesia and four hours in nulliparas with epidural analgesia (one hour less if patients do not undergo to epidural analgesia). By taking into account these limits, the diagnoses of failure to progress are reduced, and obstetric "unnecessary" interventions are decreased.

In a previous study, the authors demonstrate that epidural analgesia increased the odds ratio for a operative vaginal

birth in relation with drugs administered and timing of top-ups [8]. These factors condition also the time of the second stage of labour [9]. Therefore, the authors speculate that in a clinical setting, epidural analgesia is sometimes able to cause a failure to progress. The aim of this brief report is to investigate if some factors associated with length of the second stage of labour are the same among normal labouring women. Among these factors, special attention will be given to epidural analgesia.

Materials and Methods

A sample of 92 women who delivered vaginally among the "San Pietro Fatebenefratelli Hospital" of Rome (data collected in 2015) were assessed. This sample was therefore extracted from the same population of the series of Indraccolo *et al.* [8, 9]. Epidural analgesia schemes were the ones already reported [9]. The authors built a two-dimensional correspondence analysis among factors presumptively associated with a long lasting second stage of labour (birth weight, parity, epidural analgesia, cord rings or cord brevity, labour induction). They also investigated the role of medical interventions for shortening the second stage of labour (oxytocin infusion, operative vaginal births, Kristeller maneuvers, amniotomy) by introducing these factors in the correspondence analysis. The length of the second stage of labour

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was measured in minutes, until the complete dilatation of the cervix to delivery. Because the length of the second stage of labour differs between patients undergoing epidural analgesia and not undergoing epidural analgesia, the authors calculated the centiles of length in the group of patient under epidural analgesia, and in the group of patients without epidural analgesia. Thus, the time length of the second stage of labour was corrected by the “normal” increase of length cause by epidural analgesia. These centiles were arranged in four categories: length > of the 90th centile (long lasting second stage of labour); length between the 90th and the 75th centiles, length between the 75th and the 25th centiles, (normal length), and length < 25th centile.

Results

Table 1 describes the characteristics of the sample according to epidural or non-epidural analgesia. Birth weight were described as centiles of the whole sample. As expected, mean time of duration between epidural and non-epidural groups significantly differed ($p < 0.001$; Mann-Whitney test for unpaired data was used).

Figures 1 depicts the perceptual map of the two-dimensional correspondence analysis. The closer a point is to the centiles' length of the second stage of labour, the stronger is the association with this length. In the upper left corner of the box, readers can see that many factors associated to long lasting second stage of labour (> 90th centile) are also associated with “normal” length of labour (between 25th and 75th centiles). Remarkably, epidural analgesia is associated both with a normal course of the second stage of labour (between 25th and 75th centiles) and with a long lasting second stage of labour (> 90th centile). Interestingly, Kristeller maneuvers and oxytocin infusion are both closer to the > 90th centile, and to the 25th and 75th centiles' range, and to the 75th and 90th centiles' range. These findings suggest that Obstetricians are prompted to accelerate the second stage of labour without waiting three or four hours even in case of epidural analgesia, because they find some abnormality in labour progress, in spite of epidural analgesia.

Discussion

Despite a well known increase of the second stage of labour caused by epidural analgesia, data of this Italian small sample series suggest that, in a clinical setting, epidural analgesia can cause sometimes an abnormal increase of the second stage of labour. This problem is already expected and treated by practicing Obstetricians, who seem to accelerate labour by administering oxytocin and by performing Kristeller maneuvers. Presumptively, the schemes of epidural analgesia, the drugs administered, and the stage of the labour (cervical dilatation and head station) can affect the duration of the second stage of labour [8-10] and could lead to its abnormal prolongation. However, from the best of the present authors' knowledge, this information is still lacking in literature.

Table 1. — *Descriptive statistics.*

	Epidural analgesia (64 cases)	Non-epidural analgesia (28 cases)
Multiparity	20 (31.2%)	15 (53.6%)
Oxytocin infusion	26 (40.6%)	1 (3.6%)
Amniotomy	27 (42.2%)	7 (25%)
Labour induction	8 (12.5%)	0
Operative vaginal birth (vacuum)	9 (14.1%)	0
Kristeller maneuvers	22 (34.4%)	3 (10.7%)
Cord rings or cord brevity	27 (42.2%)	9 (32.1%)
Large babies (> 75 th centile)	16 (25%)	7 (25%)
Mean baby birth weight: (grams)	3,308 ± 332	3,269 ± 548
Length of the second stage of labour		
Mean (±st dev)	89.8 ± 60.57 min	39.46 ± 40.96 min
25 th centile	35 min	10.5 min
75 th centile	125 min	57.5 min
90 th centile	192 min	109.2 min
< 25 th centile	16 (25%)	7 (25%)
> 25 th and < 75 th centiles	31 (48.4%)	14 (50%)
> 75 th and < 90 th centiles	17 (26.6%)	7 (25%)
> 90 th centile	6 (9.4%)	2 (7.1%)

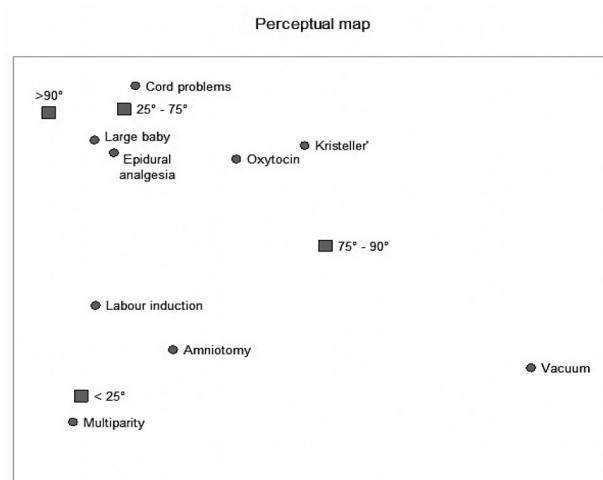


Figure 1. — The squares depict the length of labour expressed in centiles. The points depict variables involved in labour duration. The closer the point is to the square, the stronger is the association among centiles' length of labour and variables involved in labour length.

Conclusion

Epidural analgesia might sometimes abnormally prolong the second stage of labour. The factors associated to an abnormal prolongation should be further investigated.

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Corresponding Author:
 U. INDRACCOLO, M.D., Ph.D
 Via P. Veronese 2/c
 06024 Gubbio (PG) (Italy)
 e-mail: ugo.indraccolo@libero.it