Introduction

Episiotomy is the most common cause of perineal trauma during delivery, and the surgical incision is usually performed on the mediolateral right side. Recent studies suggest that functional asymmetry of pelvic floor innervation exists in healthy subjects, and it is strongly associated with postpartum incontinence if the trauma occurs on the dominant side of innervation. Surface electromyography (sEMG) in obstetrics is a novel method for detecting the innervation of external anal sphincter (EAS).

Study aim

The aim of this study is to locate the IZs of EAS by the means of sEMG, and to analyze their distribution, in order to evaluate the effect of episiotomy on the EAS muscle activity.

Results

The women were divided in two groups according to the EAS innervation asymmetry: left or right dominantly innervated. The changes of signal amplitude were analyzed in subgroups according to the delivery mode (no damage, spontaneous lacerations, caesarean sections and right side episiotomies). Out of the 225 women analyzed before delivery, 149 women who returned for the second measurement after application of exclusion criteria were used for further analysis: 56 (38%) of them had episiotomy on the right side, 44 (30%) had spontaneous lacerations, 20 (13%) had no damage, and 29 (19%) had Caesarean section. The innervation was observed to be heterogeneous with a tendency of asymmetry predominant on the right side 138 (61%) compared to the 87 women (39%) innervated on the left side. None of the women had any sphincter damage before pregnancy or wound complications after delivery.

No significant changes in EMG amplitude were observed in women who had caesarean section or delivery with no damage. While a reduction of amplitude was observed in case of spontaneous lacerations or episiotomy. In particular in case of episiotomy, the women with innervation on the right side had a stronger reduction of EMG amplitude after delivery compared to the women with innervation on the left side, suggesting that choosing the right side of episiotomy could have limited the amplitude changes.

Methods

In this prospective observational type study, 225 pregnant nulliparous women (age 28.4 ± 4.1 years) were involved. In order to detect the distribution of IZs and amplitude of EMG signals, sEMG was performed of EAS two times: during the 2nd trimester and 6-8 weeks after delivery.

Also endoanal ultrasound, Longo score assessment and faecal incontinence score (FISI) were performed during all visits in order to exclude possible sphincter damages. EMG signals were detected by a cylindrical probe with 16 electrodes and acquired with a multichannel amplifier (Trentadue, OT Bioelectronica, Turin, Italy).

Conclusions

The episiotomy performed on the right side affected significantly the innervation of women with asymmetry on the right side. Superficial electromyography showed to be a promising method for detecting innervation zones before and after pelvic floor surgery, to avoid iatrogenic damage of pelvic floor innervation, and should be always performed before delivery in order to preserve innervation of the anal sphincter.

References

2. Wietak BM. Asymmetric Sphincter Innervation is Associated With Fecal Incontinence After Anal Sphincter Trauma During Childbirth. Neurosurg. Urodyn. 2007; 86:134 -139

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