Acta Obstetricia et Gynecologica. 2007; 86: 496–497

informa
healthcare

SHORT REPORT

No cervical changes during the last week before spontaneous start of labor as assessed by three-dimensional (3D) ultrasound in women with prolonged pregnancy

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There is evidence that angiogenic factors may play a role in cervical ripening and the birth process (1). In light of these facts, three-dimensional (3D) power Doppler ultrasound has been used to investigate changes in cervical volume and blood flow indices during normal pregnancy (2–4). Here, we report the results of a study aimed at describing the physiological changes in the cervix during the week preceding spontaneous start of labor using transvaginal 3D power Doppler ultrasound.

All pregnant women attending our antenatal clinic for their first routine post-term check-up at 41 + 5 to 42 + 0 gestational weeks (3,4) were asked to undergo 3D power Doppler ultrasound examination of the cervix. Transvaginal sonography was carried out by L.R. every other day until start of labor using the same technique as described in detail in other publications (3–5). A GE Voluson 730 Expert ultrasound system (GE Healthcare, Zipf, Austria), equipped with a 2.8–10 MHz transvaginal transducer, was used. The following measurements were taken using 'any-plane' slicing: cervical length, anterior-posterior (AP) diameter and width. Cervical volume (cm^3) and power Doppler flow indices, i.e. vascularisation index (VI), flow index (FI), and vascularisation flow index (VFI) were calculated using the virtual organ computer-aided analysis software (VOCAL™), as described earlier (3–5). Inclusion criteria were: singleton pregnancy, gestational age determined by ultrasound fetometry at 12–20 gestational weeks, live fetus, intact membranes, not in labor and no vaginal bleeding at the time of the ultrasound examination of the cervix, no placenta previa, and no previous cone biopsy. Nineteen women who fulfilled our inclusion criteria and underwent at least 2 examinations constitute our study population.

Statistical calculations were performed using StatView®, version 5 (SAS Institute Inc., USA). The data obtained for each woman, i.e. cervical length, AP diameter, width, cervical volume and vascular indices were plotted against the number of days before delivery. The graphs were visually inspected, whereby individual changes in cervical variables for each woman could be assessed. A common pattern of change in cervical size or vascularisation during the last week before spontaneous onset of labor in prolonged pregnancy could not be discerned either in nulliparae or multiparae. The percentage change in results between days fell within our published limits of agreement for intra- and inter-observer reproducibility of 3D grey scale and power Doppler measurements of the cervix (5).

We conclude that dramatic changes in cervical size or vascularisation do not seem to occur in the week preceding spontaneous start of labor in prolonged pregnancy. Whether this applies also to the week preceding spontaneous start of pre-term or term labor remains to be determined. Small changes undetectable by the rather crude power Doppler ultrasound technique cannot be excluded, of course.

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(Received 23 December 2006; accepted 17 October 2006)

ISSN 0001-6349 print/ISSN 1600-0412 online
DOI: 10.1080/00016340601185269

Acknowledgements

This study was supported by the Swedish Medical Research Council (Grant Nos. K2001-72X-11605-06A, K2002-72X-11605-07B and K2004-73X-11605-09A), two governmental grants (Landstingsfinansierad regional forskning and ALF-medel), and funds administered by Malmö University Hospital, Malmö, Sweden.

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