



Post-dates amniotic fluid index: range and pregnancy outcomes.

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Abstract

Introduction

Amniotic fluid index (AFI) is a well-supported marker of foetal wellbeing. It has previously been suggested that AFI during the post-dates period may be predictive of labour and foetal outcomes. This study aims to examine the range of post-dates AFI in our population, compare it with accepted values and assess its ability to predict foetal and labour outcomes.

Methods

This study is a retrospective analysis of 752 post-dates AFI measurements at a tertiary care facility over a two-year period. Deliveries occurred in either the tertiary facility or a low risk birthing unit. Data obtained from the Viewpoint System was then match with maternity outcome data. Statistical analysis was undertaken using Stata v14.

Results

AFI measurements were obtained between 40 + 5 and 41 + 3 of gestation as per hospital protocol. AFI ranged from 0.9 to 27.9 with a mean of 10.6. The 10th centile was 5.9 and the 90th was 16.6 (95%CI= 4.9-6.04 and 15.86 and 17.3 respectively). Pregnancies with low AFI were more likely to require cervical ripening, with mechanical methods being employed more commonly. Low AFI were associated with lower birth weight and higher rate of caesarean section but not abnormal foetal lactate, pH or apgar scores.

Discussion

AFI centiles in this population differ from previously published data. Although post-dates AFI was associated with lower birth weights, it was not correlated with poor foetal outcomes. Low AFI was associated with an increase in the rate of caesarean sections. The utility of post-dates AFI assessment remains uncertain.

Background

Multiple methods of monitoring the fetus in the post dates period have been suggested including Cardio-tocography (CTG) and measures of amniotic fluid. At our institution low risk pregnancies extending beyond 41 weeks are routinely monitored with both a CTG and measure of an Amniotic Fluid Index (AFI). A normal Amniotic Fluid Index (AFI) is a well described marker of fetal wellbeing. Reference ranges for AFI exist extending to 41 weeks gestation (Magann et al, 2000). It has previously been suggested that measurement of AFI in the post dates period can inform both timing of induction and method used for cervical ripening.

Measurements of Amniotic fluid index in the post dates period has been linked with improved perinatal outcomes (Phelan et al, 1987), thick meconium stained liquor (Lam, 2006) and physiology of labour (Stigter 2002). With such conflicting results the utility of post dates AFI assessment remains in question.

This study was conducted in a Tertiary centre. Deliveries occurred either on site or at a secondary unit in a separate location. An AFI in the post dates period is considered routine practice. A low AFI will necessitate earlier induction of labour using mechanical ripening methods as opposed to hormonal methods. A normal AFI allows induction to occur at 41 weeks and 3 days using hormonal cervical ripening methods.

Results

A total of 752 maternities were included in the study. All pregnancies were categorised as low risk, having been approved to continue into the post dates period.

Measurements of AFI were obtained between 40+5 and 41+3.

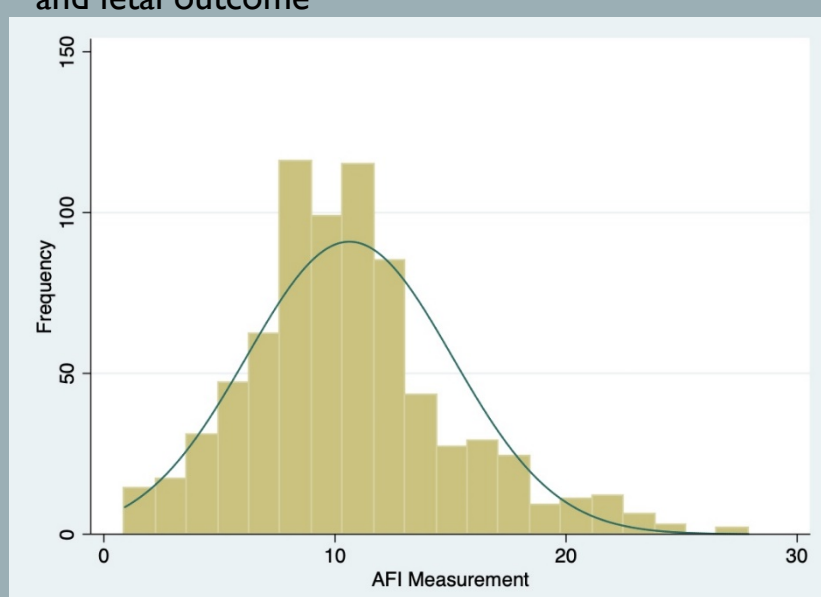
AFI measurements ranged from 0.9 to 27.9 with a mean of 10.6. 10th centile was 5.4. 86 cases (11.4%; 95%CI 9.3-13.9) were found to have an AFI measure of less than 6. Of these women, 47 (54.6%) had vaginal deliveries, 10 (11%) had instrumental deliveries and 29 (33%) had a caesarean sections. The rate of caesarean sections was significantly different between women with normal AFI versus those with low AFI.

Neonates were significantly smaller in women with low AFI (3730 vs 3487, p<0.05) although no significant difference was found in neonatal 1 and 5 minute apgar scores. Inconsistent collection of cord pH and lactate made assessment any relationship with AFI unobtainable.

Objectives

This quality control audit aims to:

- Assess the range of AFI measurements within our population and determine the applicability of the accepted 10th centile cut off of 6cm
- Assess the relationship between Low AFI measurement, mode of delivery, cervical ripening technique
- Assess the relationship between Low AFI and fetal outcome



Methods

Retrospective analysis of all women presenting to the Ultrasound department at Nepean Hospital for a measurement of AFI between 1st of January 2016 and the 31st of December 2018. This reflects routine practice at this institution.

Data regarding ultrasound measures was obtained for women from the data management software (Viewpoint, GE Healthcare) and labour and outcome data including demographic data, mode of delivery, from Obstetrix and eMaternity, the maternity database system for New South Wales.

Data matching and analysis was conducted in Stata version 14 (StataCorp, Texas, USA). Identifying features of the data was removed after merger prior to analysis.

Conclusion

Post dates AFI measurements does not appear to be related to fetal status at delivery as reflected in a neonates apgar scores. Women with low AFI have a high rate of caesarean section. Further investigation into the underlying cause for the caesarean section would define this relationship.

The utility of post dates AFI measurement in prediction of the at risk, post dates fetus remains uncertain.

References

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