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Induction of labour classification – can we explain variation in induction rates?

Abstract

Background: There is a wide inter hospital variation in the rate of induction of labour (IOL). In Australasia IOL in 2016 was 28% but varied from around 10% in some to as high as around 40% in other hospitals. Currently we are unable to explain these variations as we have no agreed system that could possibly explore why women have an IOL in the first instance.

Aims: The aim of our preliminary exploratory study was to incorporate both the gestational age and indication for IOL (using a list of common indications) as an attempt to develop a single classification.

Materials and methods: This was a retrospective audit of nulliparous women having an IOL with both live and stillborn singleton births of ≥20weeks of gestation, with cephalic presentation at Ipswich hospital, Ipswich, Queensland, Australia between Jan 1st 2014 and Dec 31st 2016. Data were extracted from the National Perinatal Database. Only the primary indication for IOL was used. The relative size of each gestational age grouping for each of the predominant indication for IOL was calculated.

Results: We have shown the proposed classification system. We illustrate the various indications and gestational ages in order of increasing frequency.

Conclusion: This proposed IOL classification system will assist one to understand the current contributors to the IOL rate. Further research needs to continue to arrive at a classification system that is universally applicable.

Keywords: induction rate, gestational age, induction of labour, neonatal morbidity

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Abbreviations: GDM/DM, gestational diabetes; SGA/FGR, Small for gestationla age/Fetal growth restriction; LGA, large for gestatioanl age; PROM, prelabour rupture of membranes; AMA, advanced maternal age; CS, caesarean section; PPH, post-partum haemorrhage

Introduction

Induction of labour (IOL) is usually performed when the risks associated with continuing the pregnancy are greater than risks associated with the induction process.[1] Although several recent systematic reviews.[2–4] concluded that IOL is not associated with the higher risk of caesarean section (CS), there still remain some concern with IOL; there is higher rates of hyperstimulation when prostaglandins are used to ripen the cervix;[5] women having IOL require continuous fetal heart rate monitoring in labour, thus reducing mobility; are more likely to request epidural analgesia and there is a higher risk of post-partum haemorrhage (PPH).[6] The increased need for monitoring in labour may also put further strain on already limited financial and human resources.[7] All these concerns may be justified as long as the IOL is for a good indication at an appropriate gestational age.

What is more concerning however is the wide inter hospital variation in the rates of IOL. The Women's Health Australasia 2016 report.[8] noted an average IOL rate of 28% in 2016 but noted that this varied from around 10% in some to as high as around 40% in other hospitals. This variation was even more apparent in the normal risk nulliparous women where the IOL rate varied from 15% to 52%. It is possible that this may be due to differing population characteristics, clinicians' choice based on their perception of risk, women's preferences and other non-identified reasons.[9–12]

Currently we are unable to explain these variations with any certainty; we do not have a widely accepted classification system to compare and monitor IOL rate in one health service over time or between health services. A classification system for women undergoing IOL has recently been proposed,[13] similar to the Robson's Ten Group Classification,[14] Although there appears to be some benefit the classification using only gestational age when labour is induced will by itself still not explain the reasons for the varying rates of IOL. More importantly it may also not help us to assess the effect of introduction of specific guidelines recommending the gestational age when IOL should be recommended for some of the discussions being proposed to reduce stillbirths. It would therefore be beneficial if we had a classification based both on the primary indication for the induction as well as the gestational age when this occurs. We felt that in this preliminary study we only include the nulliparous women having an IOL.

Materials and methods

The study population included both live and stillborn singleton births of ≥20 weeks of gestation in their first pregnancy at Ipswich hospital, Ipswich, Queensland, Australia between Jan 1st 2014 and Dec 31st 2016. Data was initially extracted from the Queensland Perinatal Data Collection Unit that collects information on all births. Information on gestational age, number of fetus, fetal presentation and onset of labour was collected. For those who had IOL, the primary indication was crossed checked with the hospital birth

register and the individual medical record. Data were entered into an excel spreadsheet. The variables were parity, gestational age and the indication for IOL. The gestational age groups were created to keep some of the well-defined gestational age groupings that are already in use particularly for postdates inductions. The relative size of each gestational age grouping for each of the predominant indication for IOL was calculated.

As this study fulfils the criteria for an audit, no ethics review was sought, in line with National Health and Medical Research Council (NHMRC) standards.[15]

Results

During the 3 year period, 8229 women gave birth in Ipswich hospital, of which 2077 women underwent IOL. The overall IOL rate was therefore 25.2 %. Of the 1490 nulliparous women, 617 women who were planning a vaginal birth had IOL. Table 1 demonstrates the classification with different gestational ages in the top row and the indications along the left hand column. The commonest indication for IOL, post- dates, accounted for 170(27.6%) of the 617 inductions with majority of them, 161(95%) being induced between 41^0 and 41^6 weeks. There were 84 inductions for GDM/Diabetes (accounting for 13.6% of all inductions) of whom 31(36%) were induced between 37^0-38^6 weeks, and 8(9.5%) were induced between 41^0-41^6 weeks. Hypertension in pregnancy accounted for 78(12.6%) of all inductions and 42(54%) occurred at ≥39^0 weeks. Twenty two of the 54(40.7%) inductions for SGA/FGR occurred at gestational age ≥39^0 weeks. The extreme right hand column shows the percentage contribution made by each of the 10 indications to the total number of women induced during the period. The rest of the Table 1 is otherwise self-explanatory and the numbers themselves are relatively small.

Table 1 Induction groups based on indications and gestational ages

	≤ 366	370 - 386	390 -406	410 - 416	≥ 420	% of all IOLs
	Group 1	**Group 2**	**Group 3**	**Group 4**	**Group 5**	
	29	**134**	**248**	**200**	**6**	**617**
a. Post dates	0	0	3	161	6	27.6
b. GDM/DM	0	31	45	8	0	13.6
c. HT in pregnancy	9	27	36	6	0	12.6
d. SGA/FGR	9	23	21	1	0	8.8
e. LGA	0	1	12	3	0	2.6
f. Cholestasis	1	9	6	0	0	2.6
g. PROM	0	4	10	1	0	2.4
h. AMA ≥ 35 yrs	0	0	12	1	0	2.1
i. BMI ≥ 40	0	0	2	0	0	0.3
j. Others/Social	10	39	101	19	0	27.4

Discussion

This paper highlights the difficulties and challenges associated with developing a form of auditable classification system for IOL. We have suggested a classification system for IOL that rely on gestational age and the predominant indication. Both these are recorded in the perinatal database and can be audited from time to time within an institution to monitor compliance with recommendations regarding IOL within current guidelines. For most of the indications listed in Table 1 there are currently evidence based guidelines on the gestational age when an IOL is recommended and such a classification may allow us to compare how closely we are adhering to these guidelines. In addition this can also be used to compare what contribution each of these groups make to the IOL rates in different institutions, possibly as a means of explaining the variation in IOL rates between institutions.

Adopting a classification system that includes both gestational age and indication may also allow one to develop areas of improvement targeted at a specific group rather than the overall population. This is important both for why a woman had an IOL but also more importantly the gestational age at which the IOL was performed.

We continue to add caution with IOL in nulliparous women; although IOL may not be associated with a higher risk of CS, we feel that for a particular nulliparous woman who is having an IOL, particularly with a very unfavourable cervix, her risk of CS is higher than if she did not have an IOL**. This is particularly relevant for a woman in her first pregnancy. If she has a CS she has a more than 50% chance of having a repeat CS in her subsequent pregnancy and the literature is clear on the issues related to increased morbidity and mortality in subsequent pregnancies.[16]

We have included indication for IOL in the classification system. We acknowledge the challenge of ascertaining the main indication for IOL and this has been noted elsewhere.[17] and it is true that in some women it is a combination of factors that make the clinician recommend an IOL but in many the predominant indication is usually clearly noted and although not perfect this may be a start of a concept of critical assessment of who is being induced when and assess how a practice in one health service compares to another.

Caution on early term IOL is required; the possible harmful effects of early birth are becoming increasingly apparent; the increased neonatal morbidity, increased perinatal mortality as well as increased infant mortality and intellectual development of children born at early term (37-38weeks) compared to late term gestation (>39weeks).[16]

The strengths of the study were that due to the relative small numbers of women involved, individual case records could be identified; essential information such as main indications for IOL could be checked against their medical records, ensuring accuracy of the data. At this stage we have focused only on nulliparous women with singleton pregnancy and realise that in future any classification system will need to incorporate all pregnant women. The small numbers was also a limitation of the study; it involved one single hospital which cannot be presumed to reflect practice in the wider health service. The clinical applicability of this proposed classification system for IOL will need refinement by retesting by other researchers.[17]

Conclusion

Our results using the proposed IOL classification system have allowed us to analyse our IOL practice and have helped us to

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understand the current contributors to our IOL rate. The results of this study may support using this framework to identify induction groups where improvements can be made to optimise care so as to obtain best outcome for the mother, the newborn during its neonatal period as well as during his or her infancy. Further research into both these objectives needs to continue to arrive at a classification system that is universally applicable.

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None.

Conflicts of interest

The author declares that they do not have any conflicts of interest.

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