The Continuous Audit, Misoprostol and Other Targeted Interventions to Reduce the Caesarean Section Rate in Induced Nulliparous Women

Yousif Alyousif[1], Per Kempe[1]

1 MidCentral DHB, New Zealand

alyousifyousif@gmail.com

RANZCOG Annual Scientific Meeting 2019 Melbourne

Introduction

This quality improvement project started by creating a continuous audit of the events and outcomes of labour and birth in the MidCentral DHB (MCDHB), a secondary level Hospital in Palmerston North, New Zealand. The continuous audit has been shown recently to be a useful quality improvement tool [1]. The data was stratified according to the internationally recognised Robson Ten Group Classification System (TGCS; Figure 2). The TGCS classifies all women into one of 10 groups that are mutually exclusive and, as a set, totally inclusive. Women are classified based on 5 important obstetric characteristics; parity, number of foetuses, previous caesarean section, onset of labour, gestational age and fetal lie and presentation [2,3]. The Robson TGCS was developed with the goal of auditing and potentially reducing the rate of caesarean section (CS) [2,3]. The TGCS allows standardised comparisons of data, including CS rate and other maternal and perinatal outcomes, across units, countries and within the same unit at different timepoints [1,4-8]. Through this process, it is possible to identify the subpopulations driving changes in CS rates and introduce quality improvement initiatives in order to lower the CS rate and improve other maternal and perinatal outcomes[1].

Method and Aim

Birth outcomes from January 2016 and onwards were collected. Data was stratified using the Robson TGCS (Figure 2). The data was analysed using SPSS, compared with international units (Figure 1) and before and after the implementation of interventions (Figure 3). The international units were chosen specifically as their data is published using the Robson TGCS, to allow a clinically meaningful comparison between similar groups. The high relative Caesarean Section (CS) rate in Group 2A (nulliparous, singleton, cephalic, induced labour ≥ 37 weeks) in our unit compared to international units (Figure 1) was recognised as an area for improvement. There was strong desire for change which led to the formation of the Maternity Guidelines and Outcomes Group. This is a multidisciplinary team (MDT) including obstetricians, midwives and consumer representatives. To address this issue, interventions included introducing low dose oral Misoprostol solution as an induction agent, continuous audit and 3-Monthly presentation of data to the department, updated induction of labour (IOL) policy, strict criteria for onset of established labour and treatment of labour dystocia. Low dose oral misoprostol solution (20-25mcg) was chosen as it has been shown to be safe and associated with similar or lower rate of caesarean section compared to other methods of labour induction[9]. In our unit, we dissolve a 200-mcg tablet of Misoprostol in 20ml of sterile water to make a 10mcg/ml solution. A 25mcg (2.5ml) dose is given orally as a solution and repeated every 2 hours for a maximum of 8 doses per day. A fresh solution is made up for each dose to ensure consistent and reliable dosage is given.

We aim to show the value of a continuous audit based on the Robson TGCS to target quality improvement initiatives with a focus on CS rate for induced nulliparous women.

Results and Discussion

Figure 1 shows the labour and birth outcomes before any interventions for Robson group 2A in MCDHB (Jan 2016-Dec 2016, inclusive) compared to international units in Sundsvall in Sweden[1], Stavanger University Hospital (SUH) in Norway[4], National Maternity Hospital (NMH) in Ireland[4] and Slovenian National Perinatal Database (SLO)[4]. MidCentral DHB had the highest rate of CS at 45.5% while Sundsvall had the lowest rate at 17.5%. MidCentral DHB also had the lowest rate of normal vaginal birth (NVB) at 36.9%, while the rate in other units ranged between 46.4% to 69.8%. This was despite having a high rate of Oxytocin use at 78.3% at MCDHB, only second to SLO (79.4%).

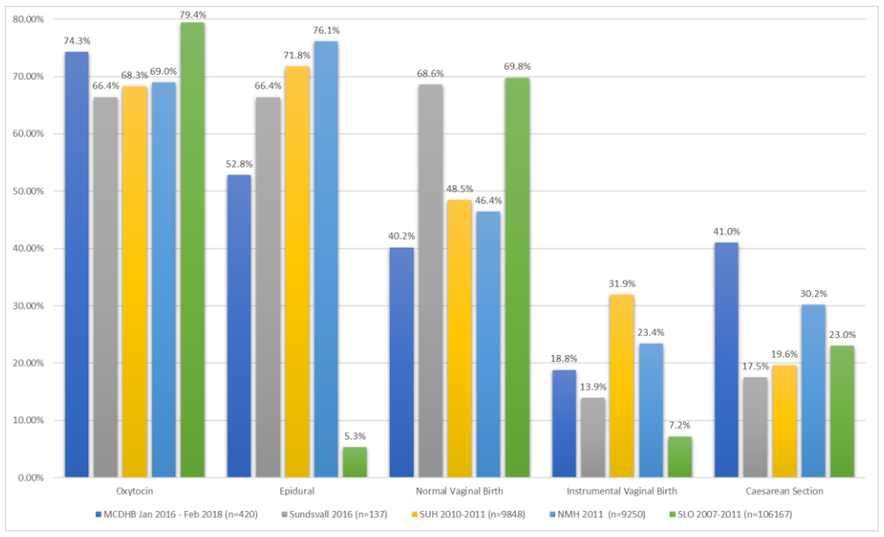
Figure 2 shows the different Robson groups. Group 2 is divided into 2A and 2B. Group 2A is the focus of this poster and refers to nulliparous women, singleton pregnancy, cephalic presentation who get induced at term, ≥ 37 weeks.

Figure 3 shows the labour and birth outcomes in MCDHB for Robson Group 2A before the implementation of interventions (Jan 2016-Feb 2018; 422 women) and after (March 2019-June 2019; 278 women). The rate of CS droped from 41% to 24.1%. The rate of NVB improved to 60.1% from 40%. Interestingly, the rate of oxytocin use dropped to 53.2% from 75.8%.

Importantly, there was no statistically significant increase in the rate of neonatal unit admissions after the implementation of our initiatives. Additionally, there was no statiscally significant difference in other maternal outcomes, such as postpartum haemorrhage (PPH) > 1000ml and sphinctear tear. The drop in oxytocin use is probably related to a combination of using low dose oral misoprostol as an induction agent and the strict criteria for defining the onset of established labour. Overall, our post-intervention outcomes for group 2A compare favourably to published data in the literature. The significant reduction in CS rate was shown to be safe and not associated with negative maternal or perinatal outcomes.

In the future, we aim to introduce universal cord Lactate measurement as a second metric to assess perinatal outcomes. This will serve as an objective test for the newborn condition and has been shown in recent studies to improve perinatal outcomes[10,11]. This improvement might be attributed to direct feedback to maternity care providers relating to fetal acid-base status at delivery influencing intrapartum care in subsequent cases[10]. Through our continuous audit, we will be able to assess the impact of this initiative in subsequent analysis of our data.

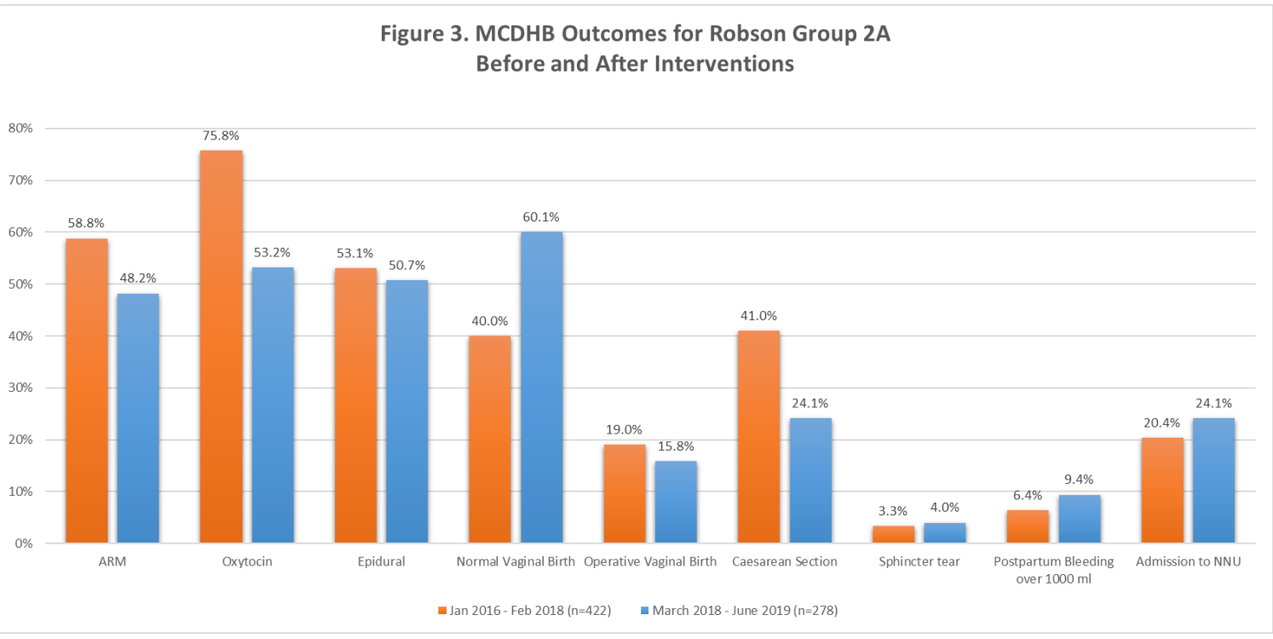
Figure1. International Comparison – Robson Group 2A



SUH, Stavanger University Hospital; NMH, National Maternity Hospital, Ireland; SLO, Slovenian National Perinatal Database

Figure 2. Robson Ten Group Classification System

Figure 3. MCDHB Outcomes for Robson Group 2A Before and After Interventions



Conclusion

Knowledge of local outcomes can play an integral role in service improvement initiatives which ultimately improve outcomes. Through this continuous audit, the high rate of CS in group 2A was recognised and lowered using targeted interventions. This drop in CS rate was not associated with a statistically significant increase in Neonatal Unit (NNU) admission, PPH or sphincter tear. There was also a significant reduction in the use of oxytocin augmentation in the post intervention group. This project would not have been possible without the commitment of the multidisciplinary team, including obstetricians, midwives, pharmacists, hospital administration and consumer representatives. Through this project, there is increased awareness that what we do, and the way we practice, can influence the outcomes for women under our care. This resulted in a change in culture and increase in the awareness amongst our staff for the care that we provide, and outcomes, for women in our hospital. We continue to use this continuous audit to identify areas for improvement and track changes over time to ensure any initiatives introduced result in desirable outcomes. We would encourage other units to consider establishing a similar audit tool using the TGCS to support local quality improvement initiatives and allow comparisons between units and over time.

References

1. Kempe, P. and Vikström-Bolin, M. (2019). The continuous audit of events and outcomes of labour and birth using the Ten Group Classification System and its role in quality improvement. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 237, pp.181-188.
2. Robson, M. (2001). Classification of caesarean sections. *Fetal and Maternal Medicine Review*, 12(1), pp.23-39.
3. Robson, M., Scudamore, I. and Walsh, S. (1996). Using the medical audit cycle to reduce cesarean section rates. *American Journal of Obstetrics and Gynecology*, 174(1), pp.199-205.
4. Rossen, J., Lucovnik, M., Eggebø, T., Tul, N., Murphy, M., Vistad, I. and Robson, M. (2017). A method to assess obstetric outcomes using the 10-Group Classification System: a quantitative descriptive study. *BMJ Open*, 7(7), p.e016192.
5. Hehir, M., Ananth, C., Siddiq, Z., Flood, K., Friedman, A. and D'Alton, M. (2018). Cesarean delivery in the United States 2005 through 2014: a population-based analysis using the Robson 10-Group Classification System. *American Journal of Obstetrics and Gynecology*, 219(1), pp.105.e1-105.e11.
6. Pyykönen, A., Gissler, M., Løkkegaard, E., Bergholt, T., Rasmussen, S., Smárason, A., Bjarnadóttir, R., Másdóttir, B., Källén, K., Klungsoyr, K., Albrechtsen, S., Skjeldestad, F. and Tapper, A. (2017). Cesarean section trends in the Nordic Countries - a comparative analysis with the Robson classification. *Acta Obstetricia et Gynecologica Scandinavica*, 96(5), pp.607-616.
7. Triunfo, S., Ferrazzani, S., Lanzone, A. and Scambia, G. (2015). Identification of obstetric targets for reducing cesarean section rate using the Robson Ten Group Classification in a tertiary level hospital. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 189, pp.91-95.
8. Vogel, J., Betrán, A., Vindevoghel, N., Souza, J., Torloni, M., Zhang, J., Tunçalp, Ö., Mori, R., Morisaki, N., Ortiz-Panozo, E., Hernandez, B., Pérez-Cuevas, R., Qureshi, Z., Gülmezoglu, A. and Temmerman, M. (2015). Use of the Robson classification to assess caesarean section trends in 21 countries: a secondary analysis of two WHO multicountry surveys. *The Lancet Global Health*, 3(5), pp.e260-e270.
9. Alfirevic, Z., Aflaifel, N. and Weeks, A. (2014). Oral misoprostol for induction of labour. *Cochrane Database of Systematic Reviews.*
10. WHITE, C., DOHERTY, D., HENDERSON, J., KOHAN, R., NEWNHAM, J. and PENNELL, C. (2010). Benefits of introducing universal umbilical cord blood gas and lactate analysis into an obstetric unit. *Australian and New Zealand Journal of Obstetrics and Gynaecology*, 50(4), pp.318-328.
11. White, C., Doherty, D., Newnham, J. and Pennell, C. (2013). The impact of introducing universal umbilical cord blood gas analysis and lactate measurement at delivery. *Australian and New Zealand Journal of Obstetrics and Gynaecology*, 54(1), pp.71-78.