



Efficacy and cost-effectiveness of cervical-ripening-balloon versus vaginal prostaglandin in the induction of labour.

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Introduction

Induction of labour, the process of artificial uterine stimulation to commence labour, is now increasingly performed in high income countries, with an incidence of up to a quarter of all term births. Despite being at term, an estimated 50% of these women have unfavorable cervixes (1).

There is now a huge range of induction methods to choose from: mechanical devices such as cervical ripening balloon, pharmacological agents such as prostaglandins or oxytocin and other adjuncts such as acupuncture (2). The choice of induction agent generally depends on indication for induction, urgency for delivery and any obstetric or fetal concerns. However, in the absence of limiting factors, the choice may lie on the woman's preferences and costs and efficacy play huge parts in influencing patients' choices.

This study sets out to analyse the cost-effectiveness and efficiency of two methods of induction: a mechanical method of cervical ripening balloon against a chemical alternative of prostin.

Methodology

Women who attended KKH Women's and Children's Hospital's delivery suite from 2015 to 2017 were prospectively recruited and randomized to either CRB or PGE group.

We analysed efficiency, the time taken to achieve active labour, by the average time taken from induction of labour to cervical os dilatation of 4cm. We also analysed delivery methods, patient satisfaction and the total costs incurred. Statistical analysis was performed with Mann-Whitney U test, where p<0.05 was considered statistically significant.

Results

205 patients were recruited. 102 patients received CRB while 103 patients received PGE.

In the CRB group, 72 women were nulliparous and 30 were multiparous. In the PGE group, 74 women were nulliparous and 29 were multiparous.

The efficiency of induction methods, the average time taken to achieve cervical dilatation of 4cm, was 13.62h in the CRB nulliparous group and 7.88h in CRB multiparous group.

It took 21.11h in PGE nulliparous women and 21.43h in PGE multiparous women.

There were no incidence of uterine hyperstimulation in the CRB groups. The incidence of uterine hyperstimulation in the PGE group was 3.9% (4 patients).

In the nulliparous CRB group, 31 (43.1%) women had normal vaginal delivery (NVD), 6 women (8.3%) required assisted vaginal delivery (AVD) and 35 women (48.6%) required caesarean section (CS).

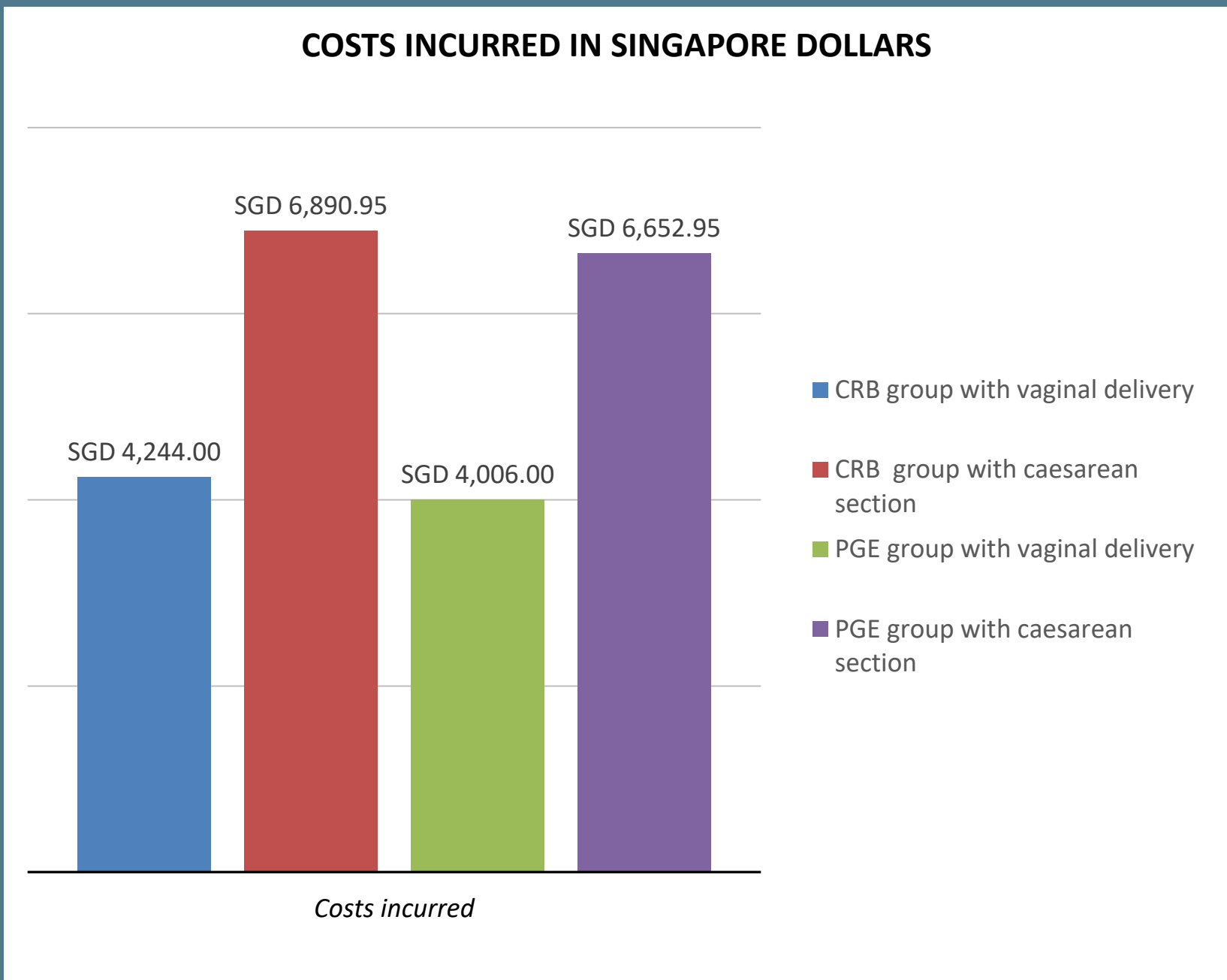
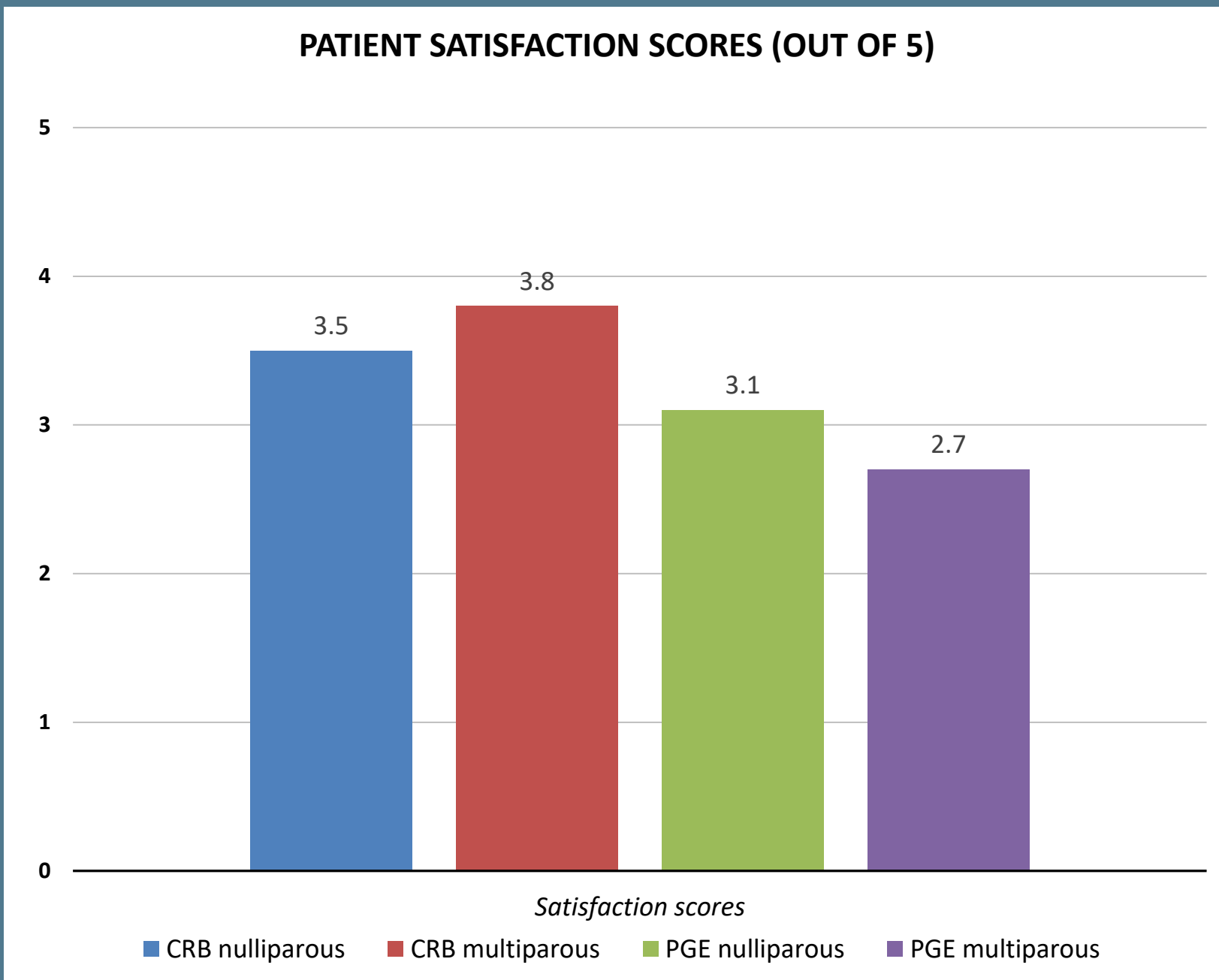
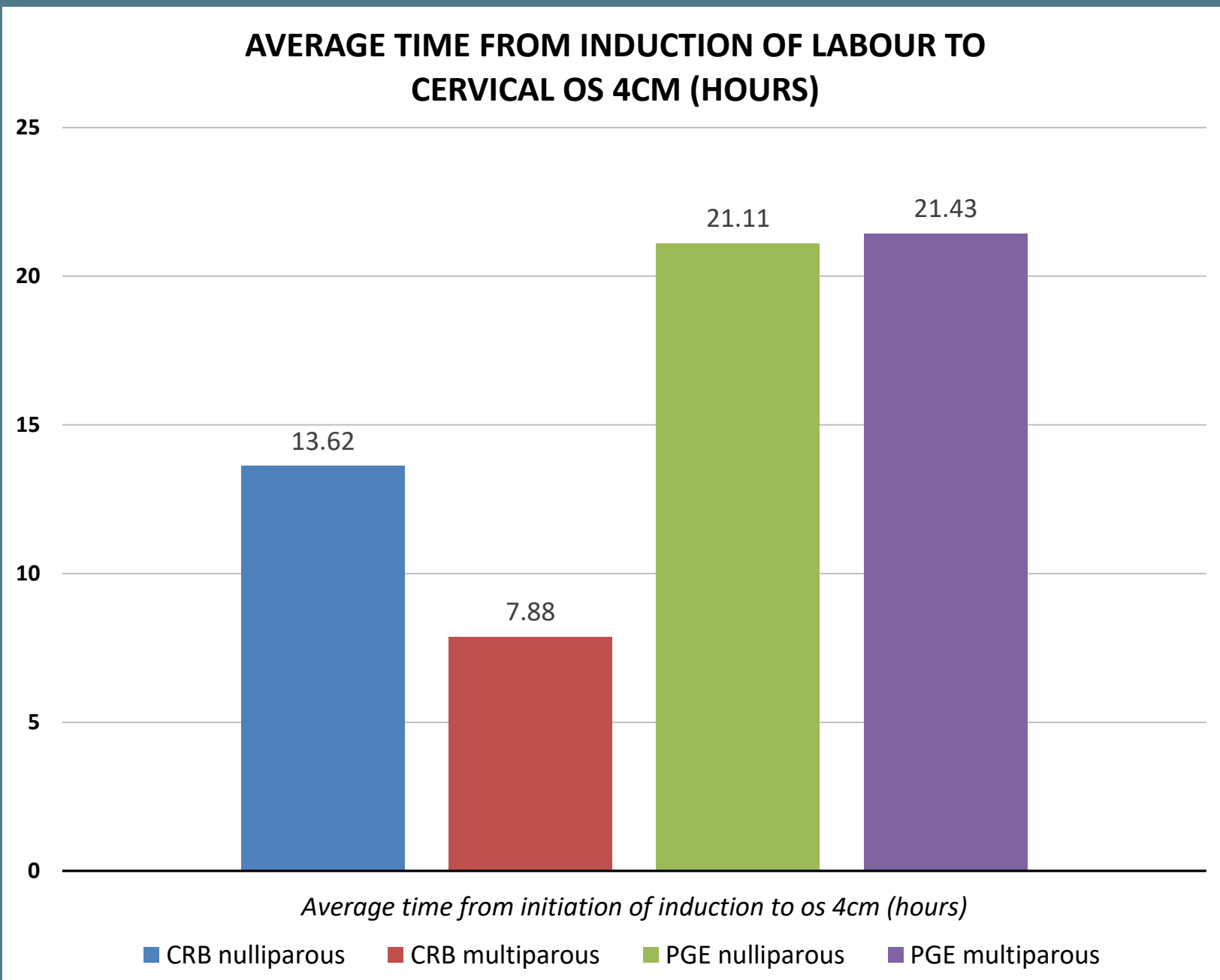
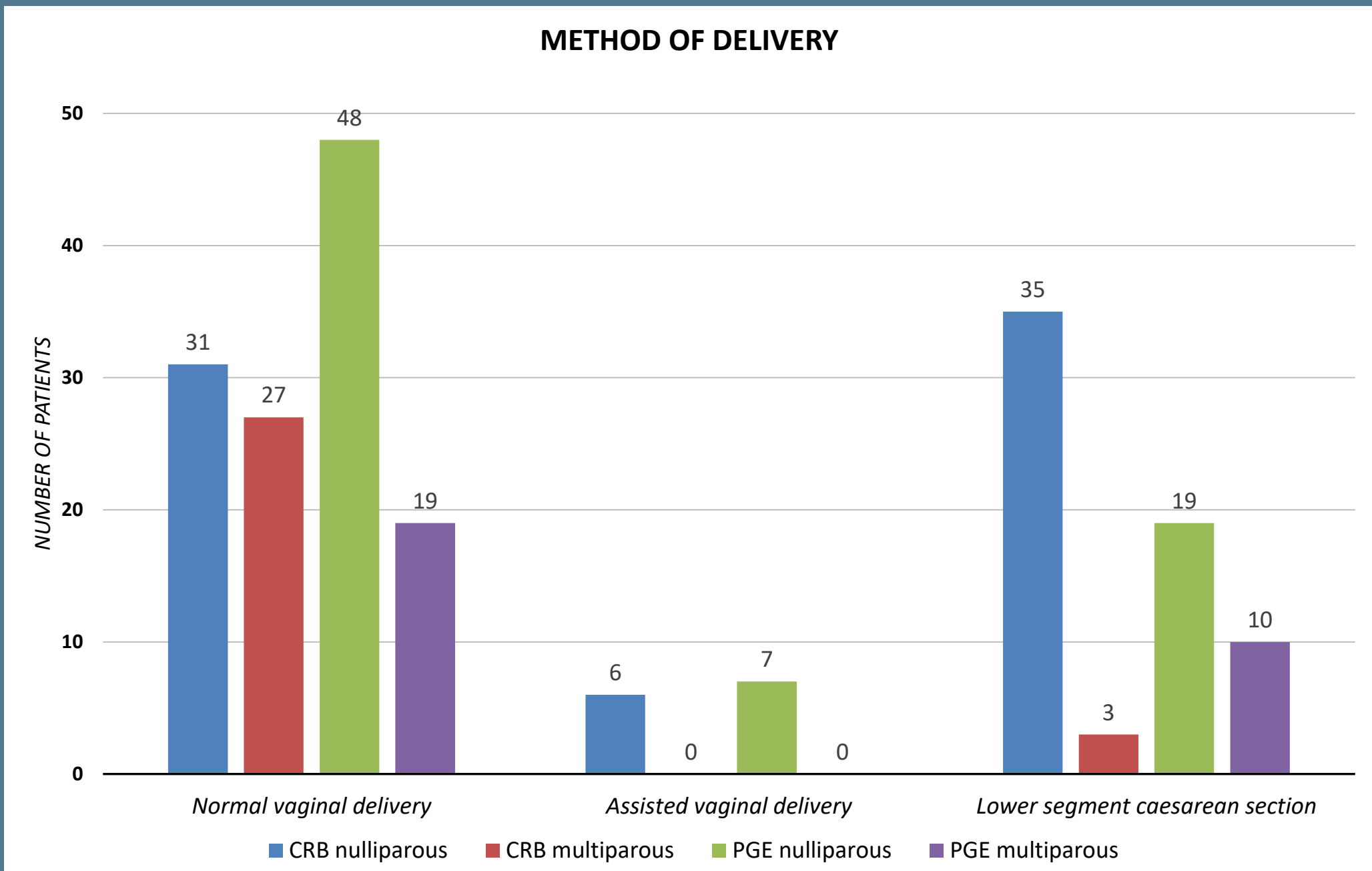
In the multiparous CRB group, 27 women (90%) had NVD while 3 (10%) needed CS. The average costs of NVD was S\$4244.00, AVD was S\$4467.00 and CS was S\$6890.95.

In the nulliparous PGE group, 48 women (64.9%) delivered by NVD, 7 (9.4%) required AVD and 19 women (26%) required CS.

In the multiparous PGE group, 19 women (65.5%) delivery vaginally while 10 women (34.5%) required CS, of whom 4 were for non-reassuring fetal signs on CTG and 6 were for failure to progress.

The average costs for NVD was S\$4006, AVD was S\$4229 and CS was S\$6652.95.

For the CRB nulliparous group, patient satisfaction score was 3.5 points and for the multiparous group, score was 3.8 points. For the PGE nulliparous group, satisfaction score was 3.1 points and for multiparous group 2.7.



Conclusion

- The **efficacy is similar in both groups**. **Average cost of both methods are also similar** dependent on the mode of delivery.
- CRB has better satisfaction scores in patients and a better safety profile**. Thus, it may be better suited for pregnancies which are more susceptible to fetal distress secondary to uterine hyperstimulation.
- In the **multiparous PGE group**, **more women required caesarean section than the multiparous CRB group**, possibly due to hyperstimulation.
- The **study is limited** as we have not accounted for the individual costs in each patient.

Acknowledgement

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- Alfirevic Z, Keeney E, Dowswell T, Welton NJ, Medley N, Dias S, Jones LV, Caldwell DM. Methods to induce labour: a systematic review, network meta-analysis and cost-effectiveness analysis. BJOG. 2016 Aug 123(9):1462-70.