3 fold combined analysis of caesarean sections at a rural regional hospital in KZN, to determine target groups for intervention

Author: P. Smit. B.Med (clin prax) UP. (Supervisor: Dr. N. Mayat. (FCOG))
Lower Umfolozi Regional War Memorial Hospital, Department of Obstetrics and Gynaecology. 0836563491/pia.smit@kznhealth.gov.za

Introduction
Caesarean sections rates (CS) have become increasingly high over the last years, and it is well known that CS contributes largely to maternal morbidity and mortality. This increasing rate is not an isolated incident, but rather a national concern, as stated by the safe caesarean monograph of 2013 (1)Trends as depicted by the saving mothers short report of tri-annum 2011-13 show an overall South African rate of 23.1%, with KZN being highest per province at 28.8%, and regional level hospitals accounting for 40% (also highest) of CS deliveries over the 3 consecutive years of this analysis(2). Lower Umfolozi Regional War Memorial Hospital (LURWMH) is a regional level mother and child only hospital based in KZN, and as suggested by the Saving Mothers Report by demographic evidence is in fact dealing with a strikingly high CS rate. Rates as captured by the department of health information service (DHIS) show an overall tri-annular rate of 53.6% at LURWMH (3). Structured auditing of CSs assist to identify groups that contribute to the high rates and interventions may bring change. A 3 month pilot study has been done in 2015 in this same institution (LURWMH), but no interventions were proposed or followed. The results yielded (using the Robson 10 criteria) identified the groups ’primary CS’, and ‘CS for previous CS’ as the highest contributors. (4). A study done (presented at the 2006 priorities) at a different hospital in a different province using the same Robson 10 method yielded similar results, but again, no proposed interventions were noted (5)

Objective/aim:
To determine the main contributors to the high CS rate at LURWMH (A regional rural hospital in KwaZulu-Natal Province, South Africa) and identifying potential areas for intervention

Methods:
Retrospective data was collected of all women delivered by C/S over 9 consecutive months. As concluded by the article; Classifications for Caesarean Section: A Systematic Review, there are different means to classify CS’s, under broader classification groups, namely; by women, by indication, by urgency and by other. (6) In this audit, the same sample/number of cases was analysed using all the first 3 abovementioned methods.

One can ask: Who? Why? And when are CS’s done
Women: Robson 10 method
Indication: NICE evidence based method

Robson method was used (table 3) and cases were grouped using a flow diagram to prevent any confusion. (See image above)
The evidence based indications were categorized into broader groups for analysis, as depicted by (table 2)
The same indications were then redistributed into the appropriate urgency category. (See table 1)

<table>
<thead>
<tr>
<th>Urgency Category</th>
<th>Definition</th>
<th>Timing of Delivery</th>
<th>Targeted delivery time</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Immediate threat to maternal or fetal life</td>
<td>Emergent</td>
<td>15 minutes</td>
</tr>
<tr>
<td>2</td>
<td>No immediate threat to life</td>
<td>Urgent</td>
<td>45 minutes</td>
</tr>
<tr>
<td>3</td>
<td>Requires early delivery</td>
<td>Unscheduled</td>
<td>Within hours</td>
</tr>
<tr>
<td>4</td>
<td>Elective</td>
<td>At a time to suit the mother and health services</td>
<td>Normal working hours</td>
</tr>
</tbody>
</table>

Table 1
Results:
(n=3295) CS delivery cases reviewed

Delivery trends: January 2016 - September 2016

Total deliveries: 6044
- Vaginal: 2706 (44.7%)
- Assisted: 43 (0.7%)
- CS: 3295 (54.5%)
  - Elective: 710 (11.7%)
  - Emergency: 2585 (42.8%)

Indication:
Previous C/S, (both elective and emergency combined) accounted for (n1052=31.9%) of all CS’s. Conditions pertaining to foetal compromise followed with (n881=18.4%), and conditions associated with failure to progress accounted for (n600=10.9%) see graph 2

Urgency:
Elective CS accounted for (n710=21.5%) (Scheduled category 4) and emergency CS (overall) accounted for (n2585=78.5%) -noting that urgent (category 2) is the highest among the emergency categories. See graph

Women:
Robson 10 grouping criteria identified the Primary CS group with (n1170=35.8%) as leading, (Group 1 (n663=20.1%) & 3 (n507=15.7%) combined) followed by CS for previous CS with (n723=21.9%) as the highest contributors. See graph

Conclusion
By using the 3 different categories we could isolate the target group for intervention to:
1. ‘emergency’ CS for (urgent conditions that merit an emergency CS booking)
the (previously un-operated) spontaneous labouring women; with signs of foetal compromise or failure to progress
2. As well as, a CS for the previously operated women.
Intervention

As concluded by the article severe hypertension in pregnancy: Using dynamic checklists to save lives it has been researched and acknowledged that checklists improve safety and outcome in patient care. Implementing such tools is a starting point to securing standardized assessments of these conditions. (9) In the aforementioned study, the focus was on hypertension in pregnancy. The proposed methods for intervention will therefore be by use of checklists but in the areas now identified:

1. Practical prevention the primary CS
Focusing on standardized diagnosis and management of foetal compromise and failure to progress.

2. Reducing the CS for previous CS rate
Vaginal birth after caesarean (VBAC) should within safe parameters be emphasized

*Preventing the primary CS will also directly result in the decline of CS for previous CS and in an adjunct to the VBAC

1. Standardized diagnosis and management of
   a) failure to progress and b) fetal compromise.

   a) The group of failure to progress mainly involves the diagnosis of poor progress and CPD. The 4 p’s of ESMOE is designed to clinically assess the possible causes for slow progression of labour. By using ESMOE intra partum care Module (7) A checklist tool has been devised to aid in recognizing these conditions. See tool 1

   b) The group of foetal compromise mainly involves the diagnosis of foetal distress, MSL or Non reassuring/pathological CTG. By standardizing the analysis of the CTG, in conjunction with MSL grading and dilatation, one may easier assess the appropriateness of the decision for CS, as well as aid in the interpretation of the CTG itself. Using 2016 ESMOE CTG Module (8), again, a checklist (stamp) tool has been devised, that will be printed on to all CTG’S. See tool 2

   *The full supporting ESMOE guidelines are placed in the labour ward

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### Classification of CTG by ESMOE 2016

**Features:**
- Contractions, Heart rate, Variability, Accelerations, Decelerations

**Categories:**
- Normal: all 5 features fall into reassuring category
- Suspicious: 1 non-reassuring category
- Pathological: 2 or more non-reassuring or 1 abnormal category (8)

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### Tool 1

#### Slow progress noticed?

<table>
<thead>
<tr>
<th>Patient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adequately managed her Pain?</td>
</tr>
<tr>
<td>Is she hydrated?</td>
</tr>
<tr>
<td>Is the bladder empty?</td>
</tr>
</tbody>
</table>

**Powers**

| Is she having adequate contractions? | yes | no |

**Passenger**

| Is it an abnormal presentation or position? | yes | no |
| Is there a foetal abnormality eg hydrocephalus | yes | no |

**Passage**

| Pelvis too small/baby too big? | yes | no |
| Is there caput? | yes | no |
| Is there moulding? | yes | no |

**If you have attempted and excluded all these possible causes for slow progress call for the snr M.O. to assess**

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2. The safety of the VBAC and the maternal consent should always be considered.

Tools to strengthen this may lead to more agreeable VBAC’s and more success, by looking at the safety parameters of VBAC by the safe caesarean monograph of 2013(1) A VBAC safety and consent checklist tool has been devised, (using below guide of the safe CS monograph, also printed on back of the form.) see tool 3
Assessing suitability for VBAC by safe C/S monograph:

History:
- Number of previous CS, Indications & complications.
- Any other surgical procedures involving the uterus.
- Any previous notes/verbal instructions about the mode of delivery.
- Number and outcome of previous vaginal deliveries & birth weight.
- Any problems in the current pregnancy.

Examination:
- Check for type and number of laparotomy scars.
- Exclude multiple pregnancies.
- At 36 weeks and beyond: check the SFH to estimate fetal size, the lie, presentation and liquor volume.

Contraindications to Vaginal Birth after Caesarean section (VBAC):
- Multiple previous CSs
- Previous classical CS, DeLee, inverse T, and J type incisions, gynaec surgery; cornual ectopic, myomectomy, perforation or evacuation, or uterine rupture.
- Previous stillbirth or neonatal death related to problems during labour
- Grossly contracted pelvis, obvious by clinical pelvic examination
- Large foetus. Suggested weight/SFH of < 3.2kg/38cm
- Breech presentation or transverse lie, or abruption.
- Any other maternal or foetal condition which would normally require a caesarean section for safe delivery (1)

The above intervention plans are to be instituted at Lower Umfolozi Regional War Memorial Hospital in due course, and an audit following implementation should by hypothesis show changes in the CS rate, comparable with this first audit cycle.

Can we safely reduce the rates in each given area without compromising maternal and fetal wellbeing?

References:
3. District of health information system. (DHIS)
5. Farrel E. Using The Robson Classification System of Caesarean Sections to Audit Caesarean Section Rates and Improve Care. The 25th Conference on Priorities in Perinatal Care in South Africa 2006; (25):