Original Research Paper

Volume-9 | Issue-7 | July - 2019 | PRINT ISSN No. 2249 - 555X

Gynaecology

CHANGES IN MALLAMPATI SCORES IN LABOURING PATIENTS

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KEYWORDS :

INTRODUCTION

Normal pregnancy is associated with enormous physiological changes, which are in peak during last trimester and during labour. Most important consideration for anaesthetist is airway management. Maintenance of the airway during obstetric anaesthesia, which is difficult to estimate still remains the single most important cause of anaesthesia related maternal morbidity and mortality. Proper evaluation of the airway anatomy and airway structures is vital to prevent airway management related catastrophes. Pregnant state is accompanied by increased in progesterone and estrogen levels with vascular effects, changes in balance of bronchoconstrictor and bronchodilator prostanoids and increased level of peptide hormones that alter connective tissue characteristics[1]. Due to the hormonal and oncotic alterations in pregnancy, the upper respiratory pathway undergoes anatomical changes leading to increased vascularity and oedema of the upper respiratory mucosa[2].

Mallampati score is the commonest, quickest and easiest way to assess a patient's airway with regard to ventilation and intubation. Although the single usage of the Mallampati classification has limited discriminative power for difficult tracheal intubation, it is a simple, reproducible, and reliable preanesthetic airway assessment method when performed properly. In addition to difficult tracheal intubation, Mallampati class 3 or 4 is an independent predictor for difficulty of mask ventilation during anesthesia induction[3]. This assessment takes into consideration the anatomy of the oral cavity and is particularly concerned with the visibility of the base of the uvula, faucial pillars and soft palate. As already described soft tissue of upper airway is influenced in our study structure by interstitial fluid. Thus as the pregnancy period is increased the MPS class, theoretically at least may change towards more difficulty, and this should aggravate during labour when the soft tissue oedema is most exaggerated.

Keeping these things in mind we undertook a study comparing MPS in pregnant patients before and after labour pains and we also tried to find a co relation between the MPS change and intrapartum weight gain of the patient. Influence of addition of oxytocin or prostaglandins change in MPS was also studied.The study was undertaken in Kamla Nehru State Hospital for mother and child and in Simla Sanitarium Hospital after obtaining informed consent from the patients.

METHOD AND MATERIALS

Study was conducted on 100 pregnant females with similar demographic profile. Parturients coming for delivery, but not in active labour were enrolled in the study after obtaining informed consent. The Mallampati grade was evaluated in the sitting position, with the head in neutral position, mouth opened as wide as possible, and without phonation. Mallampati score was noted before active labour i.e. during latent phase of labour, at second stage of labour i.e. "full dilatation" and then again after 15 minutes post delivery. Drugs used to augment labour i.e. oxytocin and prostaglandins, if used were also noted. Parturients gain of weight during pregnancy was also recorded.

RESULTS

	Before active labour	At "full dilatation"	Post delivery
MPS 1	15	10	12
MPS 2	52	32	33
MPS 3	28	50	47
MPS 4	5	8	8

	Total number	Number of patients with change in MPS	%
No Augmentation	17	1	5
Oxytocin Alone	40	12	30
Prostaglandins Alone	21	5	23
Combination of oxytocin & PGs	22	12	54

Weight Gain	Total Number	Number of patients with change in MPS	%
< 5 kg	12	0	0
5-10 Kg	63	18	28
>10 kg	25	12	45

DISCUSSION

In parturients, Anatomically, swelling and friability of the nasopharyngeal and oropharyngeal tissue occurs secondary to capillary engorgement. The parturients' airway can become compromised and tracheal intubation more difficult. Intubation prediction with Mallampati class is still commonly used. The course of labour can change the Mallampati score, with the biggest increase in Mallampati 3 and 4 grades occurring between the first and second stages of labour.[4] There is an increase in the number of the Samsoon modification of the Mallampati class 4 by 34% at 38 weeks of gestation from those at 12 weeks of gestation. The underlying cause for this change is attributed to fluid retention that occurs with pregnancy.[6]

Our study demonstrated increase in MPS score when patient went into labour with the effect continuing in post delivery period also. In our study 28% patients had MPS II before active stage of labour, 50% at 2nd stage (78% increase) and 47% post delivery (67% increase). Also 3% patients had MPS III before active stage of labour, 8% at 2nd stage (60% increase) and 8% post delivery (60% increase). Increase in MPS has been established in many studies. Kodali et al[7] did 2 studies to evaluate airway changes in women undergoing labor and delivery. They used the conventional Samsoon modification of the Mallampati airway class. In the second study, upper airway volumes were measured using acoustic reflectometry at the onset and the conclusion of labor. Acoustic reflectometry software computed the values for the components of upper airway, oral volume, and pharyngeal volume. In study 1 (n-61), there was a significant increase in airway class from prelabor to postlabor ($P < 0.001$). The airway increased one grade higher in 33% and two grades higher in 5% after labor. In study 2 (n-21), there were significant decreases in oral volume ($P < 0.05$), and pharyngeal area ($P < 0.05$) and volume ($P < 0.001$) after labor and delivery. This study shows increase in MPS grade from prelabour to postlabour period as is also demonstrated in our study.

Most commonly augmentation of labour is done with oxytocin, prostaglandins or sometimes both of them are used. When prostaglandins were used for induction MPS change was noted in 23% of patients, with oxytocin 30% and when both were used 54% of patients had change in MPS. Change in MPS was also associated with gain in weight of patients during pregnancy. Patients with weight gain between 5-10 kg MPS rise was seen in 28% of patients. Weight gain of more than 10kg was associated with change in MPS in 45% patients. Change in MPS scores from their prelabour values was also noted by Boutonnet M[5] et al in a study done on 87 pregnant patients. The study was done to determine the changes in Mallampati class before, during, and after labour, and to identify predictive factors of the changes.

Mallampati class was evaluated during the 8th month of pregnancy (T1), placement of epidural catheter (T2), 20 min after delivery (T3) and 48 h after delivery (T4). Factors such as gestational weight gain, duration of first and second stages of labour, and i.v. fluids administered during labour were evaluated for their predictive value. Mallampati classes 3 and 4 were compared for each time interval. The proportion of patients falling into Mallampati classes 3 and 4 at the various times of assessment were: T1, 10.3%; T2, 36.8%; T3, 51.7%; and T4, 20.7%. The differences in percentages were all significant ($P<0.01$). This study also confirms the change in MPS values during labour and also in post labour period as compared to prelabour values hence collaborating with results of our study.

Thus airway difficulty increases with duration of labour and is reflected through simplest of assessment tool, that is Mallampati Scores; hence repeated evaluation of airway is of utmost importance to prevent catastrophes during ventilation and intubation.

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