

Topic Overview: A4.1 Special Airway Challenges: The Airway in Pregnancy

Module A4.1

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Objectives

- Preparation and planning in predicted difficult airway management
- To recognise potential airway compromise
- To co-ordinate team to manage the potentially difficult airway in pregnancy
- To recognise need for senior specialist help early
- To manage patients in the context of available resources

Principles of Airway Management in Pregnancy

Management of the airway of the pregnant patient in the emergency department has multiple considerations which should be made early.

- Increased difficulty is expected on pre-induction assessment.
- Involve specialist teams early, including anaesthetics, obstetrics and neonatology/paediatrics.
- Pre-medication early in anticipation of airway management.
- Prolong the pre-oxygenation time to reduce hypoxia risk.
- Positioning is essential for management of the anatomical changes.

DON'T FORGET THE HIP WEDGE

On assessment of the airway of the pregnant patient the clinician should always expect an increased degree of difficulty, as the usual factors involved in airway become more difficult as pregnancy progresses.. LEMONS and BOOTS may still be used in this population during the assessment process, though this is yet to be validated.

Because of the increased difficulties and risks to mother and baby, specialist input should be sought early – anaesthetics and obstetrics input for both airway intervention and ongoing care is strongly advised. If delivery is anticipated the neonatologist or paediatrician should be informed. Again, it is important to have practiced, prepared and planned a failed intubation drill.

If airway intervention is anticipated and there is time, then pre-medication with sodium citrate and ranitidine may provide some decrease in gastric acidity, as the pregnant woman has delayed gastric emptying, increased volume and acidity which can contribute to aspiration pneumonitis.

Proper positioning of the patient should be performed in all intubations to optimise the view of the larynx, and pregnant women are no exception. Reverse trendelburg will have several effects including improving the laryngeal position to improve grade of view, use gravity on breast tissue to aid insertion of blade, increase the FRC by using gravity to lower the diaphragm and potentially improve gastric emptying. A wedge under the right hip is required in later pregnancy to reduce aorto-caval compression which reduces venous return and can cause cardiovascular compromise. In trauma associated with pregnancy

spinal immobilisation should be maintained, this may require the entire bed to be rolled to the right, or manual displacement of the gravid uterus.

Pre-oxygenation will prolong time to desaturation, through nitrogen wash out. The use of nasal prongs for apnoeic oxygenation is again advised. This is with the ultimate aim of avoiding periods of hypoxia for both maternal and fetal well being.

Challenges of the Airway in Pregnancy

There is an increased progesterone levels and higher total body water, which leads to mucosal hyperemia and oedema, increasing risk of traumatic bleeding and smaller airway. Ventilation is more difficult with bag valve mask due to facial oedema plus decreased chest wall compliance. Therefore, smaller tubes and suction should be prepared and the most experienced person should intubate to avoid prolonged intubation attempts.

There is a higher grade of laryngeal view due to positioning with the wedge under the right hip and the laryngeal odema. There is a 1/300 incidence of failed intubation compared with 1/3000 in general population. Pregnant women may have larger breasts and potential obesity. This is essential to consider in the preparation and planning phases of the RSI procedure. The insertion of the laryngoscope blade is more difficult due to breast enlargement and weight gain or obesity. Consider the use of a shorter handled laryngoscope. Other equipment that may be available for the increase difficulty include short handle, McCoy and Kessel blades. The use of a video-laryngoscope such as the CMAC may also improve the view and success of intubation. For all intubations with expected difficulty the failed intubation drill should be discussed with all members of the team and senior experienced resources should be sought and available on site.

Pregnant women desaturate faster as there is a smaller total lung capacity and functional residual capacity (20% decrease and more in supine) due to the upward pressure on the diaphragm. Thus there is less oxygen reserve and the apnea time to desaturation is decreased. Oxygen consumption is greater in pregnancy, especially in active labour (VO₂ up 25% and up to 60% in active labour). And there are risks to the unborn baby from desaturation. This adds to the increased importance of pre-oxygenation and getting the endotracheal in promptly.

Consider the underlying cause and need for rapid sequence induction. Management of the airway in pregnancy is part of the treatment plan for the whole patient. The condition which has led to the decision to intubate the patient, any underlying cause, complication and co-morbidity should be a factor in the management plan, pre and post induction. This plan should involve both the mother and the baby as patients. The physiologic changes of normal pregnancy need to be considered when choosing ventilator settings and acid-base end points. These should be discussed with the intensive care where this care will be continued.

All drugs which are unionised and lipid soluble will cross the placenta, these include induction agents and analgesics. Neuromuscular blocking agents are ionised and hydrophilic thus don't cross. It is important to consider the induction and ongoing sedation drugs when intubating a pregnant patient, there is an increased level of awareness in pregnancy and this is important to consider in choosing these medications.

Summary

- Intubation of the pregnant woman requires early specialist input, all events are potentially difficult.
- Consideration of two patients occurs in all facets of care, the baby will be harmed if there is maternal hypoxia or hypotension.
- Positioning of the pregnant woman involves a right hip wedge to reduce aorto-caval compression and reverse trendelburg to increase functional residual capacity.

References

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