



Anesthetic considerations with anemia :

What is anemia ?

- Its decrease of number or RBC in blood that hold O₂ to body tissues by the blood .
- Inadequate O₂ delivery to body tissue .

What are types of anemia ?

- Iron deficiency anemia : low iron amount that forming HB .
- Sickle cell anemia : abnormal HB shape HBS ,so problem in carrying O₂.
- Aplastic anemia: bone marrow hypoplasia so affect all blood cells including RBC ,it's the most real problem for anesthesia : avoid Neuraxial anesthesia ,avoid ETT to prevent trauma & GA under hygienic condition to prevent infection .
- Thalassemia : problem in globin protein synthesis , so the problem in HB synthesis , its either minor or major ,that the problem with anesthesia ,with severe anemia .
- Methaemoglobinemia
- Vitamin deficiency anemia: that needing to forming HB & RBC

Keep in mind :

- HB level in anemia
- Male : <13.5 mg/ 100ml
- Female<12.5 mg / 100ml



- Risk anemia in anesthesia is $< 10 \text{ mg} / 100 \text{ ml}$

Why anemia effect anesthesia ?

- In adequate O₂ delivery to tissue so hypoxia
➔chemical imbalance ➔organic failure
- Why heart failure happen in late anemia ?
- Tachycardia ↑
- ↑C.O.P
- ♥Compensatory mechanism can't hold more ,so heart failure

What are your pre-operative management ?

Avoid hypoxia by:

- pre induction by good oxygenation in GA anesthesia
- spontaneous ventilation GA used only in short procedures.
- support Neuraxial anesthesia , by nasal cannula .
- prevent sudden drop in C.O.P & blood pressure.
- ↓dose of I.V anesthetic drugs that cause reduce in C.O.P
Slow infusion to prevent sudden fall of C.O.P
- I.V fluids, blood & its products should warmed before given .
- avoid positions that cause decrease in C.O.P
- Avoid shivering & fever that cause increase in O₂ consumption .



- Avoid hypovolemia , dehydration , hypoxia , tachycardia, hypothermia , shivering & pain.

Which better choice GA or Neuraxial ?

General anesthesia :

Volitatal anesthesia can cause peripheral vasodilatation & ↑ blood loss , then decrease in C.O.P

I.V anesthesia can cause sudden sever drop in C.O.P

Sympathetic stimulation cause ↑ HR , C.O.P, then ↑ on heart muscles .

Neuraxial anesthesia :

- less blood loss .
- Sudden ↓ BP after administration of regional anesthesia , so can avoided by small dose with adding opioid ,or intermittent doses like in epidural& good hydration .

Met hemoglobin : is a form of hemoglobin that has been oxidized, changing its heme iron configuration from the ferrous (Fe^{2+}) to the ferric (Fe^{3+}) state.

Unlike normal hemoglobin, met hemoglobin does not bind oxygen and as a result cannot deliver oxygen to the tissue . cause of low oxygen saturation, and often mistaken for the more common causes of hypoxia by anesthesiologists .



Cyanosis and 85% oxygen saturation on pulse oximetry before anesthesia could indicate high met hemoglobin levels. Despite adequate oxygenation .

Methemoglobinemia treatment is immediate intravenous administration of methylene blue (1-2 mg/kg) and the removal of toxins or drugs that could cause it. Methylene blue acts to enhancement of enzyme that break down the met hemoglobin , its hereditary , there is mild or sever according to the type of inheritance .

It's better to using GA than Neuraxial anesthesia , because all types of Zylocaine can provoke the case , so its contra indicated .

There are especial list of drugs should be avoided with met haemoglobinemia

<u>Rarely</u>	<u>Uncommon</u>
Acetaminophen	
Fentanyl	
Phenbarbital	
Chloroquine	Sulfonamides
Nitrofurantoin	
Lidocaine	Amethocaine
	Cetacaine
	Tetracaine
	Nitrates
	Derivatives
	Methylene Blue
	Metoclopramide

THANK YOU



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THANK YOU