FUTURE OF ANAESTHESIA AND ANESTHESIA PRACTICE IN THE NEXT DECADES

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Science of Anaesthesiology took documented birth on 16 October 1846 (WTG Morton) with the public demonstration of ether for alleviation of pain, even though same time chloroform was in use. Various herbal and chemical cock-tails were used in 'pre ether days for the purpose of producing anaesthesia and the **ether days in Anaesthesia** practice dominated over a century. Change of style of practice occurred with discovery of muscle relaxants (1942) and the use of halogenated hydrocarbons (Halothane – 1951). Advent of curare produced rapid advance in the development of operative surgery. The first 100 years in Anaesthesia practice is deeply immersed in mystery and the scientists who kept 'an open mind' those days in Anaesthesia research paved the way for development. Modern Anaesthesia developed in the last sixty years and the journey of 'MORTON' to MODERN' Anaesthesia is amazing.

The future of Anaesthesiology is difficult to predict but we could arrive at certain semi definite conclusions on interpolating biotechnological as well as computer technological advancements, possible in future. Before proceeding to visualize what may happen in future, let me summarize the changes I witnessed in my last 37 years of career.

ANAESTHESIA IN 1970'S - INDIA

I was not knowing anything about anaesthesia but I was attracted during my student days by the **'Man in green'** seen only at operating rooms and engaged in seducing all who came across to pleasant sleep. I was spell bound by the magic of putting people to 'sleep and waking them up' with injections and making inhale gas. When I started practice, ether was much in use but was making its exit at major centers, and next in line were Trilene and Ethyl chloride. Chloroform was not being used in India from late 60'S onwards. The induction agent used was thiopental. Relaxants used were flaxedil, curaree and succinyl chloride. Halothane was available, but predominant vapour in use was Trilene. Classical general anaesthesia consisted of Oxygen + Gas + Relaxant + IPPV + Morphine. Narcotic of common use was Morphine or Pethidine. Regional techniques were very much in use, mostly subarachnoid block, and epidural and local plexus blocks. Main local anaesthetic used was lignocaine and 5% lignocaine was preferred for subarachnoid block. Elective ventilation was under relaxant cover and only controlled mechanical ventilation mode was available. Weaning of patient was a long drawn out experience. Procedures were labelled as GA/RA/ sedation/ Local. Monitored anaesthesia care has not come in. The monitors available were hand on pulse, visual assessment, heart rate

monitor/ ECG monitor and sphygmomanometer. I was happy to carry on in the area of my choice.

AFTER 20 YEARS – 1990'S – PRACTICE STYLE UNDERGOES SEA CHANGE – INDIA

Induction agent Pentothal remained but propofol appeared. Except suxamethonium, all old time relaxants gone and new array of relaxants with fewer side effects came in to use. Morphine and Pethidine were available, but a variety of synthetic narcotics surfaced. Notable of them are buprenorphine, fentanyl, Alfenanil. Regional Anaesthesia became more popular and neuraxial blocks established over the plexus or local nerve, blocks. Bupivaccine was being widely used. Local anaesthetic 5% lignocaine enters exit stage. Techniques of anaesthesia remain as GA, RA, Local and sedative anaesthesia. The sedative anaesthesia metamorphoses as 'monitored anaesthesia care' (1985). Ventilatory parameters available surprised every user. Electronic circuits are put in place of electrical circuits of earlier days and we witnessed introduction of inspiratory phase as well as expiratory phase controlled ventilators. Weaning becomes fairly easy and mathematical. Pain clinic gets established. Analgesic delivery becomes accelerated (PCA). Management of acute pain and chronic pain are dealt separately. Stress given on post operative pain relief, proper pre operative optimization. Critical care/ intensive care units are being handled by anaesthesiologists. We indulge in peri operative care of our patients. Isoflurane enters market in India. **By mid 90's MAC gets further fashioned - 'MAC' read as Midazolam**, **Alfentanil and Conversation**. New array of monitors makes appearance. ECG/ Pulse oxymeter /Capnography/ PAP. As a middle aged practioner, I get contented and believe that we have today all needed drugs/ equipments and the protocol. Practice is well set for future.

Laparoscopic techniques appear and patients start preferring lap-surgey. CT/MRI becomes common investigations and compatible anaesthesia machines are available. Airway control saw decreasing use of mask ventilation and the new device **laryngeal mask airway (LMA)** occupies central stage of airway management.

IN 2010 – WHERE AM I AND MY PRACTICE

Let us fast forward. I may admit that act of patient care has changed dramatically. Whole over world, we started earning the name 'care givers' and 'quality in practice' gets established in developed world. Two streams get identified (a) fast track and (b) conventional. 'Fast tracked' stream stabilizes outpatient surgery and anaesthesia.

Now looking back, I feel, I was barbaric in my earlier practice or I was engaged in 'guerilla fights'earlier in operation rooms with the patient.

Many developments occurred in the last 15 years in therapeutics, monitors and automation.

Inhalational anaesthetics were developed to meet our choice of the day. Isoflurane is superceeded by desflurane, servoflurane and now to cycloflurane. Newer analgesics, anxiolytics emerged (Dazitol, Dexmedetomidine). Analgesic pharmaco-kenetics are integrated to computerized drug delivery and PCA advanced to remifentanil PCA. Monitors also have advanced. The earlier ones are now referred as conventional monitors. EEG assisted Bispectoral Index has become the standard of care. Even EEG guided anaesthesia delivery systems are also made available. Nearly all patients are dealt as outpatients and surgical techniques are mostly endoscopic. All old techniques still remain, but well established as 4 different entities GA, RA, Local and MAC. MAC has now come to mean 'Madam, are you comfortable? The present scene we are able to witness owing to the availability of new generation forgiving drugs, finer supportive gadgets and awareness.

PRACTICE IN FUTURE AND ANAESTHESIOLOGY OF FUTURE- 2040-2050

Very difficult to make accurate prediction. We can make only imaginations and dreams. Imagination belongs to Researchers and dreams to clinicians. In such a situation we will turn around as time and technology demands. Prediction helps us to prepare for future, but has to be modified with advancing knowledge.

Two possibilities are possible by the end of four decades (2050). One possibility that anaesthesia will be an extinct specialty and next possible prediction is that anaesthesiology could be a dominant specialty.

The reason for first presumption is made because anaesthesia will be remotely controlled soon, ICU/CCU's will be managed by pulmonary Physicians and number of Surgeries except trauma related will be come down, pain clinics will give way to palliative care clinics. The table side anaesthesia service will come down and so of our employment.

More optimistic possibility will be, that in next twenty five years there will more intensive care beds in hospitals and need for chronic beds will be very low. Anaesthesiologists will be reformed as care givers and they will look after the hospital critical care beds, pain clinics, bioterrorism protection, in addition to providing anaesthesia for surgery.

Let us dilate the speculations.

In another 30 years surgical anaesthesia will be administered and monitored by computers. Robots will perform airway intubation. Regionals will be modified in its technique of application and may not even need manpower. Surgical anaesthesia could be conducted even in the absence of anesthesiologist. All these are possible because of the intellectual foundation on which the specialty is based as well as its ability to help all branches of medicine in its development through anaesthesia related research. Drugs of future will be target pointed without any side effects and they will carry out the required effects through modulations on receptors. Non invasive monitors will occupy a major role. Anaesthesia machines will be speaking machines and they may tell if you are going wrong. There will be only transfusion of synthetic blood and genetic engineering will transform

bacteria to blood product. These are the acceptable dreams which will become a reality in 20-25 years provided we are interested in sharpening our intellectual foundation. Anaesthesia postgraduate teaching programmes are shaped such a way today giving more emphasis on pre operative evaluation, post operative care and on lessons in applied research in the developed countries. All these visualizations are possible only if we all share information globally. The traditional slow track anesthesia service will end as an exercise of the past.

As towards existence as anaesthesiologist unless you are equally skilled in conduct of clinical anaesthesia, managing critical care, proficient in running pain service, doing research as well as administration, you may suffer extinction in future decades.

Beware and best of luck.