Introduction

Intravenous regional anesthesia (IVRA) is a technique where by tourniquet cuffs are used to restrict blood flow to a body part such as an exanguinated limb and retain anaesthetic locally in the limb during surgical procedures . [1]

Pain is "an unpleasant sensory and emotional experience,associated with actual or potential tissue damage, or described in terms of such damage. Every tissue in the body is supplied by special nerve receptors called 'nociceptors'. These are nerves which are specially designed to detect painful (or 'noxious') stimuli, for example extreme heat, mechanical damage like a pinch, or irritating chemicals. When the nociceptors detect a painful stimulus, the nerve will fire off an impulse which travels back along the nerve fibre to your spinal cord. From there, the pain message is conveyed up to the brain via a spinal neuron (nerve), travelling up through a part of the brain called the thalamus before ending in many different areas of the brain's cortex. [2]

Intravenous regional anesthesia (IVRA) was first described by August Bier in 1908 . He observed that when local anaesthetic was injected Intravenously between two tourniquets on a limb , a rapid onset of anaesthetic occurred in the area between the tourniquets and a slower onset occurred beyond the distal tourniquet . Today the technique has been slightly modified and uses either a single or double tourniquet at one site and injecting local anesthetics as distal as possible to the cuff .[3]

Intravenous regional anesthesia (IVRA) is indicated for any procedure on the arm below the elbow or leg below the knee that will be completed

within 40-60 minutes. Onset of anaesthesia is rapid and resonable muscle relaxation can be obtained [4]

IVRA is technically straightforward and does not require specific anatomical knowledge . Findings from puplished series show successful anaesthesia in 96-100 % of patients with a low incidence of side effects . It's a reliable simple and safe method of providing anesthesia for minor surgical procedure to the extremities if it is administered by experienced clinicians . The limiting factor for IVRA is time to onset of tourniquet pain . Findings from several studies have shown that adjuncts to local anaesthetics prolong anesthesia time and reduce tourniquet pain .[5,6,7,8]

Many local anesthetic drugs have been used for (IVRA), but 0.5% prilocaine is the drug of choice as it has less systemic side effects and is partially taken up in the lungs before reaching the systemic circulation.the usual dose is 40ml(200mg)without epinephrine . Other local anaesthetic agents have been used but do not provide superior analgesia or a more rapid onset of block . Additives to local anaesthetics increase the length of postoperative analgesia and decrease tourniquet pain as:cis-atracurium (0.01mg/kg) shortens the onset time of anesthesia and improves quality of anesthesia, ketamine alone appears to provide good sensory analgesia but some patients loose consciousness and exhibit the typical features of ketamine anesthesia after tourniquet release.In recent studies the addition of Ketorolac 20mg, Tenoxicam 20mg. Dexamethasone 8mg or clonidine 1ug/kg to 0.5% Lidocaine solution(40ml)has been evaluated. An improvement in tourniquet pain and postoperative analgesia was shown in a group of patients receiving a

mixture of 0.5%Lidocaine and a study drug with either 0.5%Lidocaine alone or Lidocaine and a study drug given systematically, no significant side effects was observed.[3]

The addition of Neostigmine to prilocaine in IVRA shortened sensory and motor block onset times, prolonged sensory and motor block recovery times, and improved quality of anesthesia while prolonging the time to first analgesic requirement. The side effects seen with neostigmine were usually associated with systemic absorption but did not require treatment. The addition of neostigmine to local anesthetics in IVRA is effective in increasing the quality of anesthesia.[9]

The addition of Nitroglycerine(NTG) to lidocaine in IVRA also shortened sensory and motor block onset times, prolonged sensory and motor block recovery times, and improved tourniquet pain while prolonging the time for first analgesic requirement and decreasing total amount of analgesic without side effects.[10]

With IVRA the complications are usually pressure related for instance , nerve injury can occure due to excessive pressures ; intra operative bleeding can occure due to inappropriately low pressure ; restricted venous return can occure due to failure to deflate the cuff completely or to remove it from the limb after surgery .[1]

AIM OF THE WORK

Is to re-evaluate the interavenous regional anesthesia and to measure the effect of local anesthetic drugs with their additives in prolonging the duration of action of anesthesia and reducing the tourniquet pain .