Regional Anesthesia in Children; Beyond the Caudal Block

An essay submitted for the fulfillment of Masters Degree in Anesthesiology

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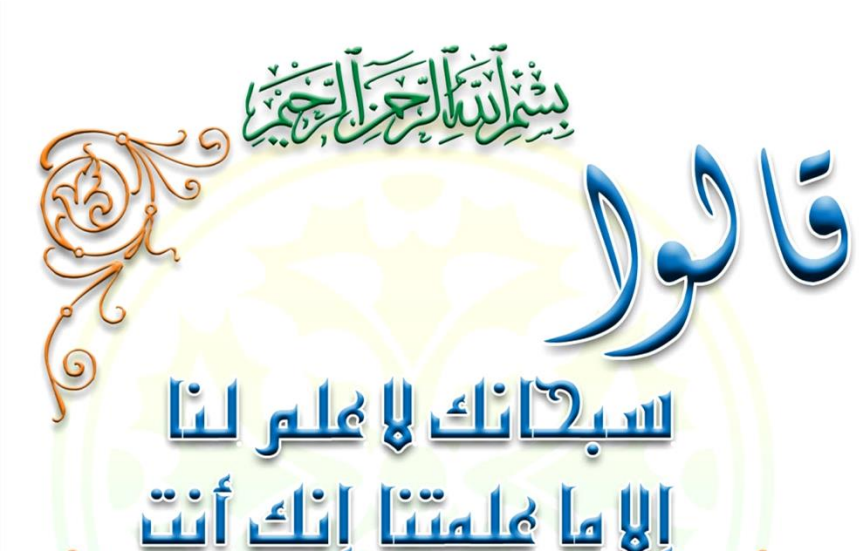

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List of Contents

List of Abbreviations

Abbr.	Full-term
ASIS	Anterior Superior Iliac Spine
AAG	α1-Acid Glycoprotein
Cmax	Peak Plasma Concentration
CNS	Central Nervous System
CSF	Cerebrospinal Fluid
ECG	Electrocardiogram
EDTA	Ethylenediaminetetraacetic Acid
EMLA	Eutectic Mixture of Local Anesthetics
ENT	Ear, Nose and Throat
GA	General Anesthesia
HAS	Human Serum Albumin
IVRA	Intravenous Regional Anesthesia
LAs	Local Anesthetics
LOR	Loss of Resistance
LOS	Length of Stay
MEGX	Monoethylglycinexylidide
PABA	Para-aminobenzoate
RA	Regional Anesthesia
Tmax	Time to Reach Peak Plasma Concentration
TRI	Transient radicular irritation

List of Tables

Table No.	Title	Page No

List of Figures

Abstract

The practice of pediatric regional anesthesia is several millenniums old. An Egyptian sculpture of Saqqarah, carved about ٢٥٠٠ BC, shows a scene of circumcision in which an object-"The Stone of Memphis" appears to be employed for inducing anesthesia of the penis before operation. The later civilizations turned away from these traditional analgesic practices until the end of the nineteenth and the beginning of the twentieth centuries. (**Dalens Bernard; ١٩٨٩**)

Regional anesthesia has become an essential part of pediatric anesthesia and, in many instances, represents the best option to provide intraoperative and postoperative pain relief in children whatever their ages and associated medical conditions. The increasing sophistication of medical treatments, the growing number of pediatric patients in poor physical condition scheduled for emergency as well as elective surgeries, and the constant improvement of general anesthetic techniques occasionally raise some questions concerning the benefit/ risk ratio of regional anesthetic techniques compared with that of other techniques of analgesia. (**Lippincott Williams and Wilkins; ٢٠٠٦**)

Epidural analgesia has many beneficial effects in the pediatric patient population. In clinical practice, it is commonly used to augment general anesthesia and to manage postoperative pain. Effective postoperative pain relief from epidural analgesia has numerous benefits including earlier ambulation, rapid weaning from ventilators,

reduced time spent in a catabolic state and lowered circulating stress hormone levels (**Henderson et al; ٢٠٠٨**)

Spinal anesthesia in pediatrics is most commonly used in the preterm infant undergoing anesthesia for hernia repair. Spinal anesthesia can also be used effectively in children for postoperative pain relief especially if opioids are used (**Tobias; ٢٠٠٠**)

The use of peripheral nerve blocks has been regaining significant popularity in the daily practice of most anesthesiologists. Despite the trend towards increase in the use of regional anesthesia and nerve blocks in adults, peripheral nerve blocks in children remain underutilized. (**Ivani and Tonetti; ٢٠٠٤**).

Key word:

Regional anesthesia in children

Pediatrics

Introduction

Pain is a protective mechanism designed to alert the body to potentially injurious stimuli. The alleviation of pain has been the focus of continuing human effort. Clinicians have long been misguided by the premise that neonatal and pediatric patients do not experience pain as severely as adults and that the duration of its impact may be less than in adults. (**Hatch DJ; ١٩٨٧**)

Although children have a remarkable capacity to recover from physically painful events, no data support the

belief that they neither feel nor remember pain. Indeed more and more evidence indicates the contrary.(**Prithvi et al; ٢٠٠٠**)

The effects of pain are deleterious. Pain evokes negative physiologic, metabolic and behavioral responses in children, including increased heart rate, respiratory rate and blood pressure; increased secretion of catecholamines, glucagons and corticosteroids.(**Anand and Car DB; ١٩٨٩**)

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Aim of the Work

Aim of the work is to understand physiological differences between pediatrics and adults as regard regional Anesthesia , pharmacology of local anesthetics, central neuraxial block in pediatrics and peripheral nerve block in pediatrics , to be able to perform safe and effective peripheral and central nerve blocks.