SCORPION STING AND SPINAL ANAESTHESIA-A RARE CASE REPORT

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ABSTRACT

INTRODUCTION: Spinal anaesthesia is a preferred technique used for lower abdominal and lower limb surgeries. A "failure of subarachnoid block" may be due to various reasons, one of which is to local anaesthetics. This resistance to local anaesthetic is difficult to diagnose. One might miss to elicit a history of scorpion sting in the pre-operative evaluation. Here we report one such case where spinal anaesthesia was administered and later upon noticing a failed block, a history of scorpion sting was elicited in operating room.

PRESENTATION: A 47 yr old man following trauma, suspected to have scrotal haematoma was planned for emergency scrotal exploration and evacuation of haematoma. He was assessed under ASA-IE and spinal anaesthesia was planned. Spinal anaesthesia was administered by an expert spinal anaesthesiologist and was found to be a "failure of block". A repeat spinal was given which again failed to take up. A history of scorpion sting was then elicited. Balanced general anaesthesia was administered and surgery was performed uneventful.

SUMMARY: The time of onsets of both sensory and motor blocks and time for the peak of sensory and motor blocks are significantly prolonged and in some cases there is total failure. The resistance to local anaesthetics is noted even in other routes of administration.

CONCLUSION: Patients with a history of scorpion bite exhibited apparent resistance to bupivacaine spinal block. This resistance manifested as inadequate block or block failure requiring conversion to general anaesthesia.

INTRODUCTION

Spinal anaesthesia is commonly used for lower abdominal and lower limb surgeries safely. Failure of Spinal Anaesthesia can occur even in the expert hands of experienced anaesthesiologists. Causes of failed subarachnoid block includes technical difficulties, poor patient positioning, incorrect insertion of the spinal needle, spinal abnormalities, obesity, pseudo successful lumbar puncture, errors in the injection of drug, wrong dose selection, misplaced injection, inadequate spread of the drug intrathecally, ineffective drug action, chemical incompatibility caused by adjuvant and finally the local anaesthetic 'resistance'. This resistance to local anaesthetic is difficult to diagnose. One of the etiology for Local Anaesthetic resistance is history of scorpion bite in the past. Pumping mechanism of sodium channels in the nerve fibres, involved in the basic mechanism of action of local anaesthetic agents, are affected by the scorpion venom [1]. Here we report one such case where spinal anaesthesia was administered and later upon noticing a failed block, a history of scorpion sting was elicited in operating room.

PRESENTATION

A 47 yr old man following trauma by bullock cart, developed scrotal swelling, suspected to have scrotal haematoma was planned for emergency scrotal exploration and evacuation of haematoma. History was taken (history of medical illness, prior surgeries, hospital stay, emergency scrotal exploration and evacuation of haematoma was planned for). He was assessed under ASA-IE and spinal anaesthesia was planned. Spinal anaesthesia was administered by an expert spinal anaesthesiologist and was found to be a "failure of block". A repeat spinal was given which again failed to take up. A history of scorpion sting was then elicited. Balanced general anaesthesia was administered and surgery was performed uneventful.

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KEYWORDS: Scorpion Sting, Local Anaesthetic Resistance, Spinal Anaesthesia

INTRODUCTION

Spinal anaesthesia is a blind procedure that is done by identifying the anatomic landmarks. Failure rates of 0.72-16.0% have been reported. Causes of failed spinal anaesthesia can be classified as [2]

1. Successfully injected drugs that are maldistributed relative to the needs of the planned surgery
2. Unrecognized failed injection of drug
3. Technical failure to enter the subarachnoid space, with no drug injection
4. Drug errors, i.e. wrong drugs and inappropriate additives
5. Local anaesthetic resistance
6. Pseudo block failure due to excessive expectations for speed of block onset
7. Subdural injection of a spinal dose is conceptually a possible cause of spinal block failure, but has never been reported, recognized or studied in this context of small-volume injections.

This resistance to local anaesthetic is difficult to diagnose. The Sodium channels are compose of 2 subunits- A(alpha) and B(beta). Each subunit has 4 domains (D1-4), each containing 6 transmembrane helices (S1-6). The S-4 plays a key role in channel activation. Local Anaesthetics act by blocking the Voltage gated Sodium channels. Their action is mainly by an interaction with the sixth segment of domain four of the Alpha subunit (IV-S6). Local anaesthetic resistance is related to the alpha subunit of the sodium channel, specifically to the sixth segment of the fourth domain of this subunit.

DISCUSSION

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Scorpion sting is a common occurrence in tropical countries like India. In India, 2 species of scorpion are common—the small red *Buthus tumulus*, which is more toxic and the large black *Palamneus gravimanus*. The toxins of Buthidae family tend to affect sodium, potassium and Calcium channels. They probably affect the pumping mechanism of sodium channels. Neurotoxic proteins are present in the scorpion venom. Alpha and Beta toxins act on sodium channels. Scyllatoxin, charybdotoxin and tityus toxin present in scorpion venom exert inhibitory effects on the calcium dependent potassium channels [3]. In addition they cause opening of the sodium channels at pre synaptic nerve endings. The Beta toxin binds to receptor site 4 of voltage gated sodium channels and modify the activation process of the channels. One possible mechanism for the resistance to local anaesthetic agents following scorpion sting could be antibody mediated. Due to its antigenic nature, the scorpion venom may produce an antigen-antibody response, causing antibodies to form against the scorpion venom [4]. When local anaesthetics are administered, these antibodies which are circulating, may cause competitive antagonism at the sixth segment of domain four of the alpha subunit (IV-S6) of the sodium channels, which is the site of action of the local anaesthetics.

**CONCLUSION**

Scorpion bite is common incident in our country. Still we do not consider past history of scorpion bite as a part of our routine history taking when a patient comes for any surgical procedure. Anaesthesiologists should always keep in mind the possibility of past history of scorpion bite for failed regional blocks, in all patients.

**REFERENCES**