

# Successful Spinal Block in Obstetric Patient with Past History of Scorpion Sting and Failed Spinal Anesthesia

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## ABSTRACT

Association between local anesthetic resistance and scorpion sting have been reported in literatures. Scorpion venom is known to affect the sodium channels in the nerve fibres and local anesthetics also acts on the same. But we report a case of successful spinal block in 23 years old second gravida posted for elective caesarean section with past history of failed spinal block and multiple scorpion sting 7 years and 2 years back. Last exposure was 4 months before previous caesarean section, thus failed spinal block may be due to recent exposure. Our conclusion is that, there is a direct relationship between duration of exposure to scorpion venom and susceptibility to local anesthetics.

**KEY WORDS:** scorpion bite, spinal anesthesia, local anesthetic resistance

## INTRODUCTION:

Spinal anesthesia is commonly implemented in a wide variety of surgical procedures. Scorpion bites are relatively common in subtropical countries like India.<sup>[1]</sup> Many studies have reported a correlation between scorpion sting and failure of spinal anesthesia. Pumping mechanism of sodium channels in the nerve fibres is affected by scorpion venom, thus interfering with action of local anesthetic drug<sup>[1]</sup>. Failure of spinal block in the form of delayed onset, partial action and no action have been reported in patients with history of scorpion sting. Although incidence of failed spinal block due to scorpion sting is very low, it creates a significant change in the management even in minor cases. We present a case of successful spinal block in an obstetric patient with history of multiple scorpion sting happened in our institute.

## CASE REPORT:

A 23 years old female, second gravida, 38 weeks, with history of previous lower segment caesarean section, in labour, came for safe confinement. COVID 19 status was negative.

She was posted for emergency lower segment

caesarean segment. Preanesthetic assessment was done. There was no significant present/past medical history and antenatal period was uneventful. When asked about previous surgical history, we came to know that previous caesarean section was done under general anesthesia. Then detailed history about previous surgery was taken. It was happened one and half year back, in view of meconium-stained amniotic fluid in our hospital. Spinal anesthesia was given, there was no sensory and motor action. And repeat spinal was given. As there was no action after 30 minutes, caesarean section was done under balanced general anesthesia.

As there are many reasons for failed spinal anesthesia, leading questions were asked to figure out the reason. Scorpion sting is common in our region and it is one of the causes for failed spinal anesthesia, questions were asked about that. Then she gave history of scorpion sting twice, 7 years and 2 years back over right leg and right thumb respectively. That was only four months before previous pregnancy. And her laboratory investigations were within normal limit.

History of multiple scorpion sting was there, so we were anticipating failed/inadequate spinal during this caesarean section also. Fetal and maternal parameters were normal. After explaining about the chances of failed/inadequate spinal and requirement of balanced General anesthesia, we planned to give one attempt of spinal block. Spine examination was normal. Airway assessment was done, mouth opening was adequate, Modified Mallampati score II, No missed and loose teeth, neck and temporomandibular joint normal. Fasting hours was more than 6 hours.

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After taking consent, patient shifted to operating table, monitors were attached (Pulse Oximeter, Electrocardiogram, Noninvasive Blood pressure) and preloaded with 500ml intravenous fluid Ringer Lactate through 20G intracath. Anti – aspiration prophylaxis given. Under all aseptic precaution, lumbar puncture was done using 25G Quincke's spinal needle, in sitting position and median approach at L4-L5 interspace. After free flow of clear CSF on aspiration 0.5% hyperbaric Bupivacaine 2.1 cc given. Immediately, patient was made supine. All vitals were monitored. Onset of action was immediate. Motor block was there within one minute of spinal block. Sensory block level was assessed by pinprick method. After four minutes of spinal block, sensory level was T10. Level was T6 after 10 minutes of block. Intraoperative vitals stable. Cesarean section was uneventful. Patient was comfortable. Procedure got over in 40 minutes and sensory block was at T4. It was receding at the rate of two spinal segments every 20 minutes. One hour after surgery, sensory level was at T12 and patient was able to move hip and knee.

## DISCUSSION:

Local anaesthetics acts on sodium channels. Each Sodium channel is composed two subunits alpha and beta (beta-1 and beta-2). Each subunit has 4 domains (D1-D4), each containing 6 transmembrane helices (S1-S6). S4 segment play a key role in sodium channel activation. Their action is mainly by an interaction with the sixth segment of domain four of the Alpha subunit (IV-S6). [2] Structural alteration and mutation to this specific site is related to resistance. [3]

Scorpion venom has neurotoxic proteins. Alpha and Beta toxins act on sodium channels. Scyllatoxin, charybdotoxin and tityus toxin inhibits calcium dependent potassium channels and also causes opening of sodium channels at presynaptic nerve terminals. [4] Scorpion Beta toxin bind to receptor site 4 of voltage gated sodium channels thereby modifying the activation process of the channel. Local anesthetics also acts on same channel. [5]

It is suggested that scorpion venom may modify the sodium-pumping mechanism within fibres as well as affecting the passive and active sodium permeability systems. It is the antigenic nature of scorpion venom that makes it more significant as it

may evoke a very potent antigen-antibody response. This might have led to the development of antibodies against the scorpion venom, which may be circulating even at the time of administration of local anaesthetics and may have produced competitive antagonism with them at the “receptor site”, viz that particular component of sodium channels (sixth segment of domain four of the alpha subunit (IV-S6)), where the local anaesthetics are supposed to act. [4]

## CONCLUSION:

She might had augmented response to second exposure of venom, making her even more “resistant” to the effect of local anaesthetic agents, which was more recent to previous surgery. There might be decrease in antibody titre, which made her susceptible to local Anesthetics during second surgery. This suggest that duration since exposure makes significant changes in susceptibility to local Anesthetics after scorpion sting.

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