

Case Report



Central Hyperthermia Treated with Cabergoline: A Case Report

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Abstract:

A 36-year-old male with acute traumatic spinal cord injury (ATSCI) was diagnosed with central hyperthermia after a worksite injury. After the management of infection with antibiotics guided by culture & sensitivity results and presence of persistent fever ($> 40^{\circ}\text{C}$), tablet Cabergoline was prescribed (0.5mg every week) in Hospital Day 23. Improvement in the temperature chart was noticed from Hospital Day 29 and persisted. Tablet Cabergoline may have a role in the management of Central hyperthermia.

Key point: Cabergoline tablet may have a role in management of central hyperthermia

Keywords: Hyperthermia, fever, Cabergoline, spinal cord injury, neurogenic fever, acute traumatic spinal cord injury (ATSCI).

Introduction

Hyperthermia linked with poor clinical outcome in 70% of Intensive Care Unit (ICU) patients¹. The mean incidence of fever (all origins) following acute traumatic spinal cord injury (ATSCI) is 50.6%. While the incidence of neurogenic fever (Unknown origin) in ATSCI range from 2.6 to 27.8%; which occur in cervical and thoracic injury more frequently; and can be related to thermoregulatory abnormalities^{2,3}.

Case Report

A 36 years male, admitted through Emergency Department on December 2020 after fall from height of 5 meters. He was fully conscious, vitally

stable with Quadriplegia and Comminuted Right Femur shaft fracture.

Initial neurological assessment show diminished muscular tone, areflexia, sensory level above the nipple level.

His Trauma computerized tomography (CT) scan: Burst Fracture Subluxation C5-6 with almost complete Cord Transection. The patient's magnetic resonance imaging (MRI) of Spine found acute comminuted burst fracture of C5 and its posterior element with retropulsion into the spinal canal, with torn posterior longitudinal and interspinous ligaments. Cord edema of C4 V was

noted with bilateral facet joint subluxation at the fracture site with epidural hemorrhage along the posterior aspect of C4 and C7 vertebral bodies. The retropulsion C5 vertebral body, along with epidural hemorrhage, is causing focal defect with nearly complete transection of cervical spinal cord.

The patient was admitted to ICU where he received supportive care. He was intubated 24 hours after admission because he had poor cough and was unable to clear secretions. Posterior Spinal Fixation done on Hospital Day 2. Right Femoral Fixation Nailing and Tracheostomy done on Hospital Day 6.

Soon after surgeries, he started to have high fever with rising inflammatory markers. He was diagnosed as Methicillin-resistant *Staphylococcus*

aureus (MRSA) Pneumonia that was treated appropriately by Vancomycin with resolution of inflammatory markers and Chest X-Ray findings. However, because of persistent fever, antibiotics were further escalated with adding Carbapenem and antifungal with no response. Lumbar Puncture on 26/12/2020 was brownish with innumerable red blood cells (RBCs), few white blood cells (WBCs), normal glucose and high proteins. On 02/01/2021, MRI Brain was reported normal and MRI Cervical Spine showed Haemorrhagic Contusions of C4-6.

Due to persistent fever not resolved by paracetamol, diclofenac and cooling wrap Tablet Cabergoline started 0.5mg every week on Hospital Day 23 and improvement in temperature chart start to appear in hospital day 29 and continue as clarified in (Fig. 1).

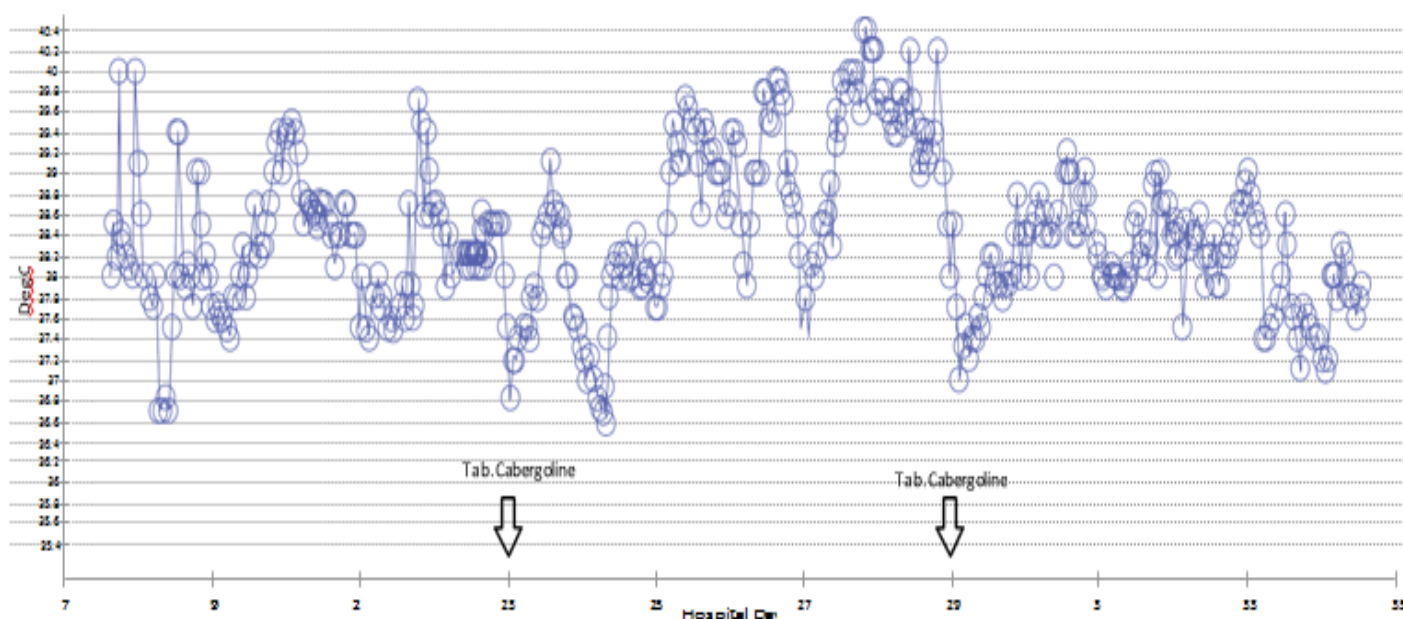


Figure 1: Temperature chart

Discussion:

Spinal cord injury can lead to fever due to infectious and non-infectious causes². Ülger and colleagues found that non-infectious fever in Acute spinal cord injury is associated with a significant higher mortality rate ($P < 0.001$)⁴.

Different hypotheses may clarify the mechanism of spinal cord injury-induced fever: (a) damage of temperature-sensitive neurons in the spinal cord; which may lead to thermo-dysregulation

independent of the sympathetic system⁵, (b) derangement of thermo-regulated functions e.g, vasodilatation, sweating, and vasoconstriction, especially in tetraplegic or paraplegic patients⁶, (c) interruption in the afferent pathway from hypothalamus², (d) release of Neurotransmitter triggered by the presence of blood in cerebrospinal fluid; which enhance the production of free radical leading to raise the concentration of intracellular glutamate, and neuron's sensitivity to injury^{7,8,9}.

Cabergoline for Central Hyperthermia

Cabergoline is dopamine receptor agonist with a long-acting and high affinity for Dopamine-2 receptors¹⁰. Some case reports highlight about the effect of Bromocriptine which is a dopamine receptor agonist, in the management of central fever^{11,12,13}. It has been linked to the effect of Bromocriptine on hypothalamus and its role on dopaminergic transmission¹¹.

Conclusion:

In conclusion, this is the first case report, to our knowledge, defines the effect of Tablet. Cabergoline in management of central hyperthermia post-ATSCI. Thus; it may be considered when other methods fail to show benefit, including antipyretic, cooling wraps, etc. This case may open the door for further studies with larger numbers of patients to assess the effect of Cabergoline in central hyperthermia.

Ethics Approval and Consent to Participate:

Institution Review Board (IRB) exempt the case report from ethical approval. Reference No: MOHAP/DXB-REC/NNN /No.121/2021. We don't obtain patient consent form based on above IRB letter and case is anonymized without highlight about any identifying information.

Human and Animal Rights:

No animals/humans were used for studies that are basis of this research.

Approve for Publication:

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The Standard for Reporting:

CARE guidelines and methodology were followed.

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Statements and Declarations

The author declares no conflict of interest, financial or otherwise.

Author Contributions

All authors contributed in case report. The first draft of the manuscript was written by Duaa Jawhar and other authors review and commented

on previous versions of the manuscript. All authors read and approve the final manuscript.

Data Availability:

The data that support the finding of this study are available from the corresponding author upon reasonable request

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