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A CASE REPORT ON LONG TERM COMPLICATIONS OF CAUDA EQUINA SYNDROME

Pharmacology

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ABSTRACT

Cauda Equina Syndrome (CES) is a rare emergency condition where the ends of the spinal cord, specifically, the lumbar and sacral spinal nerves get congested mostly due to disc herniation or trauma. The marked complication of CES includes bowel incontinence, bladder incontinence leading to UTI, high grade sores in the gluteal region and saddle anesthesia. This is one among the rarest neurosurgical emergencies. The only treatment for Cauda equina syndrome is a surgical procedure, that is, decongestion of the lumbar spinal nerves called Lumbar laminectomy. In this case report, we shall discuss and evaluate on the long-term complications of cauda equina syndrome which includes various sectors of life. This study is done to report on the long-term complication of cauda equina syndrome in relation to the relative Quality of Life (QoL) of patients.

KEYWORDS

Cauda Equina Syndrome, Quality of life, Complications, Saddle anesthesia, Rehabilitation

INTRODUCTION

Cauda Equina is the collection of the spinal nerve roots and Cauda Equina syndrome is a rare syndrome involving compression of the spinal nerves, specifically at the lumbar and sacral nerves. Multiple etiologies can cause CES and most common among them include disc herniation and trauma. It leads to a complex of manifestations and long term consequences such as bladder and bowel dysfunction, saddle anesthesia etc. It also adversely affects the patient's physical, mental, social and financial aspects of life. CES does not have a specific treatment but early diagnosis and timely management is imperative, in order to prevent the devastating complications of CES. Lumbar Laminectomy is a surgical procedure of treatment in CES. CES improves over years as spinal nerves grow 1-2 mm per year.

CASE REPORT

A 61 year old presented to the Emergency Department with complaints of fever for 10 days, nausea and vomiting for 4 days. His fever has been associated with chills for 4 days. He has no history of abdominal discomfort, loose stools, constipation and generalized weakness. On reconciliation, it was known that the patient had a fall from height in December 2015 which resulted in spinal injury and Cauda Equina Syndrome. Surgical correction was done to stabilize L1 vertebrae. The patient was catheterized due to urinary retention. On further investigations, the patient was diagnosed with Catheter associated Urinary Tract Infection, where the underlying etiology is CES. The patient was administered with a course of antibiotics for the same and discharged when the patient became symptomatically better.

DISCUSSION

Cauda Equina Syndrome is a rare, non - life threatening syndrome. The pathway for sensory input to the brain and motor output from the brain is the spinal cord. Among the 31 spinal nerves, nerves arising from lumbar, sacral and coccygeal regions do not leave the vertebral column at the same level as they exit the spinal cord. These nerves angle inferiorly alongside the filum terminale, which is an extension of pia mater, fuses the arachnoid and dura mater and anchors the spinal cord to the coccyx. The roots of these nerves are named as 'Cauda Equina'.

CES involves compression of cauda equina, resulting in a neurosurgical emergency.[1] The incidence rate accounts to 0.3 - 1 per 1,00,000 in the general population which points out that it is relatively a rare condition.[2] Multiple etiologies are involved in the development of CES among which disc herniation and spinal stenosis are the two explicit causes of CES. Since compression of cauda equina occurs, it results in an intense complex of manifestations such as lower back pain, sciatica (either bilateral or unilateral), weakness of lower extremities, saddle anaesthesia and loss of visceral function. Combination of sensory and motor deficits may present and cause bladder dysfunction. Sexual dysfunction also occurs in patients with CES.[3-5] In 30-50% of patients, following the decompression surgery, symptoms may gradually improve over time.[6] Radiologic studies will guide to confirm the diagnosis. Most patients have sensory deficits in the lower extremities. Perianal sensation is reduced and ankle jerk reflex is also absent. Surgical procedures should be considered only if symptoms are indicated and positive Magnetic Resonance Imaging (MRI) findings.[2]

Various standardised scoring systems used in this patient to evaluate the patient's quality of life with respect to the impact of long term complications of cauda equina syndrome were mentioned in Table 1.

The functional independence of the patient was assessed by using the Barthel Index and it was found that the patient was partially independent. The quality of life of the patient was assessed by using Short Form Survey (SF 36) which measures the physical functioning, role limitations, emotional well-being, social functioning, energy/fatigue, pain, general health perceptions and found that CES has significantly affected the physical functioning, emotional and social well-being of the patient. Urinary Incontinence and Fecal Incontinence was measured by using King's Health Questionnaire and Wexner scale respectively and found that the patient was significantly affected by bladder and bowel dysfunction which were the major complications of CES. In King's Health Questionnaire (KHQ) the responses in KHQ have four rating system. The eight Domains scored between 0 (best) and 100 (worst). The Symptom Severity scale is scored from 0 (best) to 30 (worst). Mental well-being of the patient was assessed by using the Warwick Edinburgh Mental Well Being Scale (WEMWBS), where the score is above than 41, indicating reduced mental well- being. The financial wellbeing of the patient was assessed by using Consumer Financial Protection Bureau (CFPB) Financial Well Being Scale, where the score was 51 showing moderate range of financial well-being in this patient. CES has a deleterious effect on socio- economic life of patients making them unable to work, leading them to a negative state of quality of life.[5] Though CES is a rare condition and due to variability in its presentation, delay in diagnosis may occur, delaying the treatment, leading to complications such as paralysis.[7] Scrupulous diagnosis at the timely manner permits the patient best chance of a satisfactory outcome.

The various lifestyle complications of cauda equina syndrome include physical deformities, emotional, socio- economic lifestyle, psychological and sexual dysfunction. The physical deformities include saddle anesthesia in the gluteal region resulting in high grade bed sores. The patient may experience bowel and bladder incontinence. The patient may not feel the bowel and bladder opening. The patient may not have any sensation whether the bowel or bladder has opened or is completed. The patient may be bedridden for a prolonged period of time.[6-9] The patient develops a negative quality of

life and sees the future life in a pessimistic angle. The patient's dependency rate increases as the patient is not able to work by himself.

Another factor to be considered includes the emotional and socio - economic life of the patient.

As the patient experiences a spinal nerve injury, the patient becomes psychologically down and requires family support. The patient will experience a drastic negative quality of life.[10] as the patient has a reduced contact with the outside environment the patient is unable to work and so the socio- economic lifestyle of the patient is reduced. This shows how much the patients are affected by spinal cord injury.

The psychological factor is another term of consideration that may require a close evaluation. A patient with high socio - economic level may get depressed or may experience a low grade feel following a spinal injury or a bedridden condition leading to a low socio- economic lifestyle. The sexual lifestyle of the patient is also a considerable factor in terms of long-term complications. The sexual unhappiness may affect a healthy relationship. The sexual dysfunction can also affect other factors, again reducing the patient's wellbeing.

On evaluating the factors using various standardized scoring systems the overall scores show that the patient had gone through and is currently also passing through a devastating negative quality of life.

Table 1- Assessing Long Term Complications Of CES Patient By Using Standardized Scoring System

Parameter	Scale Used & Result Obtained
Functional Independence	Barthel Index[11] - Partially Independent
Quality Of Life	SF 36 Scale Physical Functioning - 20% Role Limitations Due To Physical Health - 0% Role Limitations Due To Emotional Problems - 0% Energy/ Fatigue - 50% Emotional Well Being - 60% Social functioning - 0% Pain - 90% General Health - 55% Health Change - 50%
Urinary Incontinence	King's Health Questionnaire[12] General Health - 50% Incontinence Impact - 100% Role Limitations - 100% Physical Limitations - 100% Social Limitations - 77.7% Personal Relationships - 66.7% Emotions - 44.4% Sleep - 33.3% Severity Measures - 33.3% Symptom Severity Scale - 16
Faecal Incontinence	Wexner Scale[13] score: 13- Partial Incontinence
Mental Well Being	Warwick Edinburgh Mental Well Being Scale[14] score: 41- Reduced Mental Well Being
Financial Well Being	CFPB Financial Well Being Scale score: 51- Moderate Financial Well Being

CONCLUSION

Cauda Equina Syndrome is not life threatening but one among the rarest neurosurgical emergencies which can have variable presentation which not only affects the patient physically but mentally also by draining to a negative quality of life. If undiagnosed or under treated it leads to long term complications such as paralysis and will have detrimental effects on the patient's mental, socio- economic and financial status of life. The long-term complications were evaluated with 5 factors involving all sectors of life and were scored using standard scoring techniques. Therefore, the patient requires long term rehabilitation in future aspects of life. Hence clinicians should be extremely prudent about CES and its consequences. Limited evidence is available and studies on cauda equina syndrome are still being continued for future evaluation.

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Conflict Of Interest

The authors declared that there is no conflict of interest.

ABBREVIATIONS

CES - Cauda Equina Syndrome
MRI - Magnetic Resonance Imaging
SF 36 - Short Form Survey
KHQ - King's Health Questionnaire
WEMWBS - Warwick Edinburgh Mental Well Being Scale
CFPB - Consumer Financial Protection Bureau

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