

## Autonomic dysreflexia

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Autonomic dysreflexia (AD) is not an uncommon clinical condition detected in patients with complete spinal injuries at or above thoracic <sup>6</sup> vertebral level (T<sub>6</sub>). This condition is reported to occur in 48- 60 % of cases of spinal cord injury at or above the level of T<sub>6</sub>. But AD due to injury below T<sub>6</sub> is rare. The basic mechanism is thought to be due to excessive, uncontrolled activation of sympathetic system. The purpose of this article is to report a case of autonomic dysreflexia due to lesion below the level of T<sub>6</sub> in a 36-year old woman who was successfully managed in our institution.

### Case Report

#### History

This 36-year-old woman presented with low back pain and intermittent fever and a gradually increasing bony hump on the back for five months. There was a history of

Autonomic dysreflexia (AD) is a common entity detected in patients with complete paraplegia with lesion at or higher than sixth thoracic (T<sub>6</sub>) neurologic level. But AD due to lesions below T<sub>6</sub> is rare. We report on the diagnosis and treatment of a 36-year old woman with autonomic dysreflexia following a tubercular involvement of first lumbar vertebra with paraparesis. In addition we review the literature.

**Key Words:** autonomic dysreflexia, hypertension, tubercular spine

significant weight loss over the same duration. There was no history of trauma.

#### Examination

Upon arrival to our institution the patient was alert, thin built with normal vital signs including blood pressure (BP). Her cranial nerves' examination was normal. She was found to have paraparesis with the sensory level at L<sub>2</sub> with impaired sphincter functions.

#### Imaging

Lumbosacral xray of the patient showed a collapsed first lumbar vertebra with focal kyphosis at first lumbar (L<sub>1</sub>) vertebral level. Subsequent magnetic resonance Imaging (MRI) of the thoracolumbar spine revealed collapse compression of L<sub>1</sub> vertebra with significant encroachment of the spinal canal at that level. The patient underwent corpectomy of the L<sub>1</sub> vertebra followed by bone grafting successfully on the fourth day of admission.

## Hospital Course

The patient tolerated the surgery well with stable vital signs intraoperatively and in the immediate postoperative period. On the ninth postoperative day, patient's indwelling urinary catheter was removed and after about 4-5 hours, she developed altered sensorium with profuse sweating. On examination, she was afebrile; her blood pressure was 170/120 mmHg. She was drowsy but responding to verbal commands. The neck was supple. Examination of the lungs and heart was non-contributory. Laboratory reports revealed normal blood counts, blood biochemistry and electrolytes. ECG was normal. Computerized tomography (CT) scan of the head was also normal. The patient was started on antihypertensives and urinary catheter was replaced again. 'Work-up' for secondary hypertension in the ensuing 2 days was non-contributory. The patient's blood pressure normalized in 3 days even without any antihypertensives. Removal of the urinary catheter after few days was followed by similar symptoms of sweating and hypertension on the same day. Therefore, in the ensuing 2 weeks she underwent intensive bladder training and eventual removal of the catheter, which was not followed by hypertension. Based on the clinical features and absence of secondary cause, diagnosis of autonomic dysreflexia was made. Patient was discharged on the 30<sup>th</sup> postoperative day in stable condition with normal blood pressure.

## Discussion

Autonomic dysreflexia (AD) is an acute syndrome of excessive uncontrolled sympathetic output that can occur in patients who have had spinal cord injury (SCI), generally at or above T<sub>6</sub> level.<sup>1</sup> On rare occasions, it is also seen in the paraplegics with lesions below T<sub>6</sub>.<sup>7</sup> AD is more common in patients with complete lesions than those with incomplete lesions<sup>5</sup>.

The precipitating factors of AD can be any noxious stimuli below the level of the lesion, such as bladder distension, urinary tract infection, faecal impaction, pressure sores etc. Anything that would have been painful, uncomfortable, or physically irritating before the injury may cause AD after the injury.

The intact peripheral sensory nerves transmit the impulses that ascend in spinothalamic tract and posterior column but can not ascend beyond the level of the injury and hence stimulate the sympathetic neurons located in the intermediolateral gray matter of the spinal cord.<sup>4</sup> This results in generalized sympathetic response, which causes vasoconstriction below the level of the lesion.<sup>5</sup> The ensuing elevation of BP is detected by the vasomotor center (VMC) in the brainstem through the baroreceptors. The VMC, in an effort to lower the BP sends inhibitory impulses to the spinal cord to inhibit the sympathetic neurons but gets blocked by the lesion in the spinal cord<sup>3</sup>. The VMC also stimulates the parasympathetic system through the vagus

nerve. This causes compensatory bradycardia and its effect prevails above the level of the injury and are characterized by profuse sweating and flushing.

The treatment involves sitting the patient upright which will provoke orthostatic drop in the BP;<sup>2</sup> removal of tight or restrictive clothing if any; and treatment or elimination of the precipitant if possible.<sup>1</sup> If hypertension and other symptoms persist even after the removal of the precipitant (e.g. flushing of the blocked urinary catheter, removal of impacted faeces, etc.) or the precipitant cannot be removed (e.g. pressure sore, fracture, DVT, etc.) then antihypertensive medications must be used.<sup>2</sup> Nifedipine and nitrates are the most commonly used medications.<sup>2</sup> Other antihypertensives reported to be effective are hydralazine, diazoxide, prazosin and clonidine.<sup>4,6</sup>

Prevention of the AD is the best approach. Therefore, patient with spinal cord injury and their relatives should receive counseling about proper bowel, bladder and skin care techniques.<sup>1</sup> The patient may need to carry a card containing information about the clinical findings and treatment for this condition, for the benefit of the healthcare providers who may not be familiar with it.<sup>1</sup>

## Conclusions

Although not an uncommon disorder, many physicians may not be familiar with AD. AD due to lesions below T<sub>6</sub> or with incomplete spinal cord injury is rare. Prevention is the mainstay of the management. AD in our patient was due to incomplete lesion below the level of T<sub>6</sub>, which is a rare presentation.

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