Ross syndrome: A case report

Ross syndrome is a rare disorder with partial autonomic dysfunction. It is characterized by a triad of Adie’s tonic pupil, decreased or absent tendon reflexes and decreased or absent sweating. The hypohydrosis or anhidrosis initially is patchy and then becomes segmental or diffuse. There may be compensatory hyperhydrosis in the uninvolved areas. Seeking medical attention may be delayed until the hypohydrosis interferes with work. Literature review shows that less than 60 cases have been documented so far. Here we report a patient who presented with segmental hypohidrosis of 10 years duration and had all the classical features of Ross syndrome.

A 34 year old male presented to us with complaints of decreased sweating over the past 10 years. He was working as a laborer in a machinery workshop. He felt his left lower limb became more hot and also noticed decreased sweating in the same limb. The decreased sweating gradually involved the right lower limb as well as both upper limbs and the left half of face. He had heat intolerance and frequently changed jobs, as he could not tolerate the warm environment at the machinery workshops. There was no history suggestive of bladder or bowel disturbances or giddiness. There was no family history of similar illness. On examination, he had sweating only over the right half of the face and right half of the neck above the supraclavicular area. The skin and hair over the involved and uninvolved areas was normal. There were no hyperhydrotic areas. His pupils were mildly dilated at around 4 mm, sluggishly reacting to light on the left side and not reacting to light on the right. On instillation of 1% pilocarpine drops, both pupils constricted. His higher mental functions, cranial nerve examination, motor power and sensory examination were normal. All the deep tendon reflexes (DTR) were hyporeflexic. Sensormotor nerve conduction study of median, ulnar, tibial, peroneal and sural nerves was normal. Sympathetic skin response was absent over hands and feet and RR interval was abnormal at rest, with deep breathing and the Valsalva maneuver. Other tests for autonomic disturbances including postural blood pressure, heart rate variability to posture and rise in diastolic blood pressure and heart rate induced by sustained hand grip were normal. Blood sugar, thyroid profile, VDRL, ESR, CRP, ANA and CSF analysis were normal. ECG, echocardiogram, plain MRI of the spine and brain were all normal.

His skin biopsy revealed patchy hyperkeratosis, keratotic plugging, mild acanthocytosis and inflammatory infiltrates in the dermis around blood vessels, consisting of lymphocytes and a few histiocytes. Cutaneous nerve biopsy by punch biopsy of skin revealed severe reduction of intraepidermal nerve fibre density with decreased innervation of sweat glands and normal hair follicles, suggesting selective sudomotor nerve fibre loss. (Figure 1) Other systemic diseases including diabetes mellitus, thyroid, syphilis, autoimmune and connective tissue disorders were ruled out. The patient was diagnosed as Ross syndrome with its classical triad of segmental anhydrosis, hyporeflexia and tonic pupil.

Ross syndrome is a benign but progressive autonomic dysfunction, affecting both sexes, with age of onset ranging from 3 to 50 years. It is considered to be a spectrum of autonomic disorder which includes Holmes Adie syndrome and Harlequin syndrome. Tonic pupil and loss of deep tendon reflexes characterize the Holmes Adie syndrome. The Harlequin syndrome is characterized by loss of sweating without pupillary abnormalities. Ross syndrome has all three components, as seen in our patient.

Though said to be rare, individual case reports and case series have been published. In the original article by AT Ross, the author quotes at least 5 cases documented before him in his literature search. In a case series from India, mean duration of symptoms was 6 years, mean age of onset 26 years and 45% of patients had the complete triad of clinical features. Anhydrosis is due to severe loss of sudomotor fibres with normal sweat gland morphology. Sweat glands on biopsy and immune staining show only a slender network of post ganglionic fibres that did not express the markers for cholinergic (VIP) or noradrenergic (DBH) axons. The compensatory hyperhydrosis in some patients may be due to the initial or earlier loss of cholinergic M2 inhibitor presynaptic autoreceptors which precedes the destruction of post ganglionic nerve fibres. The loss of DTR is due to dorsal root ganglionic degeneration and spinal inter neuronal loss. The pathophysiology of the tonic pupil is due to damage to parasympathetic cholinergic fibres between iris and ciliary ganglion and resultant cholinergic supersensitivity. Our patient also had cholinergic supersensitivity as evidenced by pupillary constriction after 1% pilocarpine drops.
The exact etiology and pathogenesis of this Ross syndrome is unknown. One case report of ANA positivity\(^7\) and subsequent improvement with IVIg and one case report of cytomegalovirus positivity\(^8\) and partial improvement with resolution of infection has been documented, suggesting an autoimmune and infective etiology.

Our patient was treated with skin emollients and silver sulphadiazene cream and advised lifestyle modifications. We also suggested that he move to a cooler region and he subsequently was employed at a hill station. He felt comfortable with subjective improvement of his symptoms.

Due to the insidious onset and the mild nature of illness, patients with Ross syndrome often do not come to medical attention. Recent developments in staining skin biopsy for intraepidermal nerve fibre density, have facilitated the diagnosis of this condition. A greater awareness particularly among physicians, dermatologists, ophthalmologists and neurologists may increase the number of cases diagnosed.

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REFERENCES


