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Complications of Recurrent Corticosteroid Use in Patients with Erythema Nodosum Leprosum : A Case Report

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ABSTRACT

The use of corticosteroids is the standard therapy for managing leprosy reactions. However, long-term corticosteroid use can cause various complications. This case report discusses the potential complications of long-term corticosteroid use in a patient with Hansen's disease (MH) and erythema nodosum leprosum (ENL) reactions. This case report emphasizes the importance of routine monitoring in patients receiving corticosteroids to detect and manage potential complications.

Keywords: Complications, corticosteroids, erythema nodosum leprosum, morbus hansen, osteoporosis

INTRODUCTION

Leprosy is a chronic infectious disease caused by the bacterium *Mycobacterium leprae*. This disease can damage peripheral nerves, skin, and other tissues. In patients with leprosy, leprosy reactions can occur and lead to additional complications. Leprosy reactions are divided into two main types: type 1 (reversal) reactions and type 2 (ENL) reactions (erythema nodosum leprosum).[1] Treatment of leprosy reactions uses corticosteroids, including prednisone or methylprednisolone, to reduce inflammation and prevent nerve damage. [2,3]

Long-term and repeated use of corticosteroids in patients with leprosy reactions can cause various complications. Some reported side effects include an increased risk of infection, hypertension, diabetes, osteoporosis, and growth retardation in children.[1] In addition, long-term treatment with corticosteroids can also cause leprosy reactions to become chronic and recurrent, requiring additional treatment cycles..[4]

Several studies have shown that the incidence of side effects is higher in patients experiencing type 2 reactions compared to type 1 reactions. This is due to the longer duration of type 2 reactions and the tendency to recur.[3] Therefore, it is important to understand the complications that may arise from repeated use of corticosteroids in leprosy reaction patients and to seek safer and more effective treatment alternatives.

We reported a case of a patient with Borderline MH and ENL presenting with anemia and thoracolumbar compression fracture.

CASE REPORT

A 37-year-old man presented with a rash and lumps on both hands, feet, waist, and abdomen that had increased in number over the past month. These complaints were accompanied by facial

swelling and redness, as well as severe back pain that made it difficult to walk. He also had fever, joint pain, and muscle aches. He denied a history of falls and trauma. The patient was undergoing treatment for his 18th MDT MB. During leprosy treatment, the patient experienced a recurrent ENL reaction, which was subsequently treated with methylprednisolone. The patient did not have regular check-ups and had a history of taking corticosteroids without a doctor's prescription.

Physical examination revealed a moon face, multiple erythematous nodules on both arms and legs, and multiple excoriations and hyperpigmented macules, muscle atrophy, and multiple ulcers. Hematology examination revealed hemoglobin 6.8 g/dL, leukocyte count 30 × 10^3/µL, platelet count 668 × 10^3/µL, erythrocyte count 2.12 × 10^6/µL, and hematocrit 17.2%. A slit skin smear revealed acid-fast bacilli with a bacteriological index of +2.3. Thoracolumbar and lumbosacral radiographs revealed lumbar dextroscoliosis, paralumbar muscle spasm, thoracolumbar spondylosis, and a mild wedge-shaped compression fracture of the VTh12 corpus and a mild biconcave compression fracture of the VL2 corpus.

The patient was diagnosed with MH BL with type 2 reaction, accompanied by a thoracolumbar compression fracture and anemia. The patient received PRC transfusion therapy, ceftriaxone 1 x 2 grams IV, ondansetron 3 x 4 mg IV, methylprednisolone 1 x 31.25 mg IV, paracetamol 4 x 500 mg PO, clofazimine 1 x 100 mg PO, ibuprofen 1 x 400 mg PO, vitamin D3 1 x 1 caps PO, and folic acid 1 x 1 tablet PO. The patient was consulted to the internal medicine, medical rehabilitation, neurology, and orthopedics departments for further treatment.

Figure 1. Lesions are visible in the form of plaques, scars, and several ulcers.

Figure 2. Thoracolumbar X-Ray with the impression of Dextroscoliosis lumbalis, Paralumbal muscle spasm, Spondylosis thoracolumbalis, Mild wedge shape compression fracture corpus VTh12, mild biconcave compression fracture corpus VL2

DISCUSSION

Type 2 leprosy reaction, or ENL reaction, is an immune complex syndrome (antigen-antibody reaction) caused by a humoral immune response to Mycobacterium leprae. Patients experience painful nodules, usually appearing on the face and extremities. Erythema nodosum leprosum (ENL) can affect the nerves, skin, and eyes and can cause systemic disorders such as fever, weight loss, and pain. Type 2 reactions occur in types LL and BL.[17] Risk factors for reactions

include LL patients with skin infiltrates, use of MDT (Multi Drug Therapy) (except clofazimine), bacterial index > 4+, patients aged < 40 years, bacterial infections, viruses, intestinal parasites, filariasis, malaria and a history of trauma, surgical procedures, stress, immunization, pregnancy, consumption of potassium iodide and a strong positive Mantoux test result.[18] This patient had multiple, painful erythematous nodules on both arms and legs, scattered discretely, with excoriations and hyperpigmented macules, as well as multiple ulcers. He also had fever, malaise, anemia, and a thoracolumbar compression fracture.

Treatment for mild leprosy reactions involves non-steroidal anti-inflammatory drugs (NSAIDs). The World Health Organization (WHO) recommends corticosteroids as first-line therapy and corticosteroid-sparing agents as second-line therapy. Some commonly used sparing agents include:

1. Thalidomide: effective for type 2 reactions
2. Clofazimine: In addition to being part of MDT, clofazimine also has anti-inflammatory effects and can be used to treat ENL reactions.
3. Pentoxifylline: has been evaluated and is effective as a corticosteroid-sparing agent for ENL reactions.
4. Methotrexate: Although uncommon, several studies have evaluated its use as a corticosteroid-sparing agent in the treatment of leprosy reactions.[19, 20, 21]

The main goal of treating reactions is to control inflammation, manage pain, and prevent the spread or formation of new lesions in the skin, nerves, and visceral organs, thereby preventing disability and preventing subsequent episodes.[10]

Side effects of long-term use of corticosteroids include[22]:

Table 1. Side effects of long-term corticosteroid use

Effects on Metabolism	• Weight gain • Glucose intolerance and diabetes • Increased blood cholesterol
Effects on the musculoskeletal system	• Osteoporosis and risk of fractures • Muscle atrophy
Effects on Skin	• Thinning Skin • Striae
Cardiovascular Effects	• Hypertension • Edema
Neurological Effects	• Mood Changes • Insomnia
Ocular Effects	• Cataracts • Glaucoma
Gastrointestinal Effects	• Gastric Ulcers
Withdrawal Reactions	• Adrenal Insufficiency
Other Effects	• Adrenal Suppression • Cushing's Syndrome • Immunosuppression

Corticosteroids can cause decreased bone density, osteoporosis, and fractures. Corticosteroid use causes decreased bone density in the first 3-6 months, partly due to increased bone resorption by osteoclasts, followed by a gradual decrease in bone density, partly due to decreased

osteoblastogenesis and apoptosis of osteoblasts and osteocytes.[11] Common side effects include fractures of the spine and ribs. High doses of steroids can accelerate the onset of side effects.[12,13,14]

This patient received methylprednisolone therapy with an initial dose of 31.25 mg, followed by a gradual reduction in the corticosteroid dose. In this case, the patient suffered a thoracolumbar fracture, consistent with previous studies that showed osteoporosis in leprosy patients is more common in the lumbar region.[15]

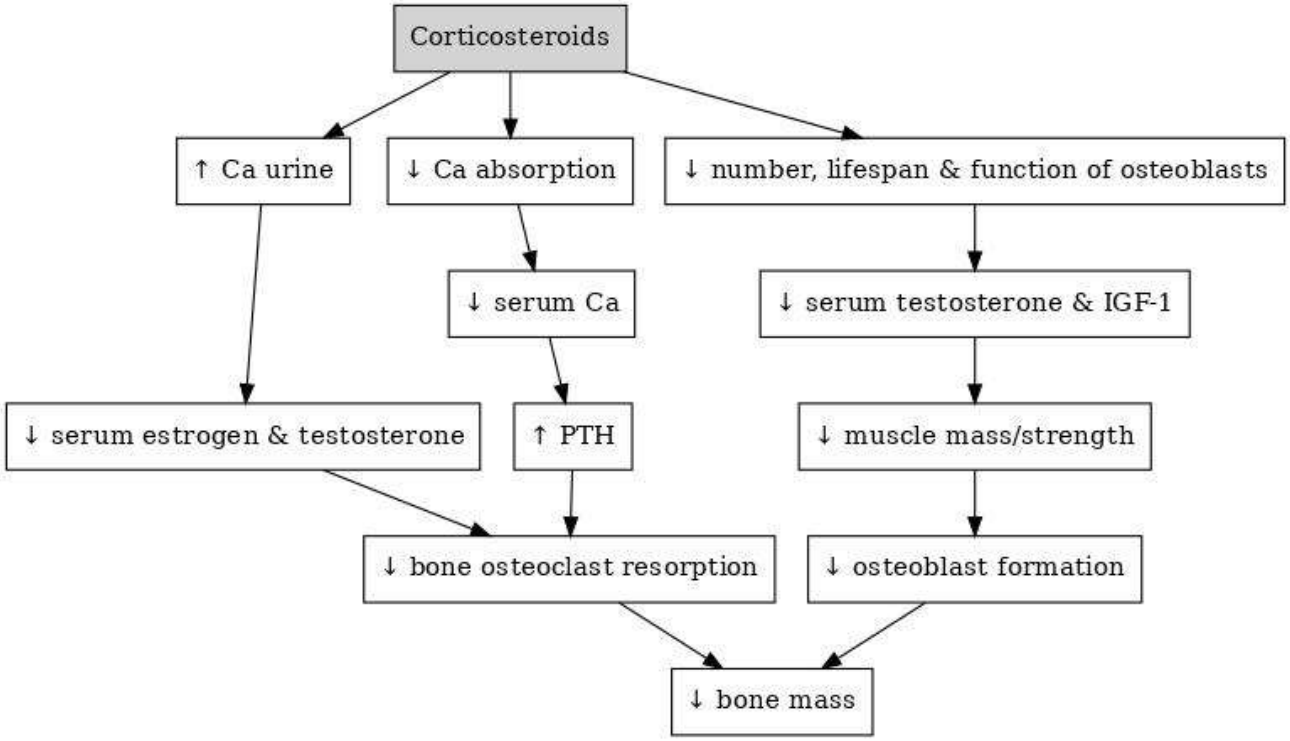

Figure 3. Mechanism of bone loss in long-term corticosteroid use. Description: Ca= calcium, IGF-1= insulin growth factor-1, PTH= parathyroid hormone. [15]

To prevent side effects from corticosteroids, it is important to educate patients about regular check-ups at healthcare facilities, adherence to medication, and avoiding medications other than those recommended by their doctor. Vitamin D and calcium supplementation is also crucial to

prevent further bone loss. These supplements can reduce pain caused by osteoporosis and fractures. Several studies have shown that the use of calcium and vitamin D in children and adults is effective in preventing bone loss.[16]

Preventing recurrent leprosy reactions will reduce steroid use. Therefore, it is important to identify and control factors that can trigger reactions, including dental caries, intestinal infections, and the patient's nutritional status. Furthermore, it is important to ensure that patients are taking MDT and using corticosteroids adequately. Sparing agents serve to reduce the side effects of steroid use. They work by shortening the duration of administration and reducing the required steroid dose. These patients are managed in collaboration with other specialists to provide optimal management.

Corticosteroids are effective in managing type 2 leprosy reactions. Long-term use can lead to various complications, including vertebral fractures. Therefore, it is important to carefully evaluate patients and consider the use of bone-protecting agents to reduce the risk of fractures.

CONCLUSION

Corticosteroids are effective in treating type 2 leprosy reactions, but inadequate and long-term use can lead to various complications, including osteoporosis. Therefore, it is important to evaluate and educate patients about the disease and treatment of leprosy reactions, and to consider the use of bone-protective agents to reduce the risk of fractures.

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