Best Practice: *Recognition and Management of Reactions*

Subthemes

- Disability prevention and treatment

Target Audience(s)

- Program managers
- Trainers
- Health staff
- Persons affected by leprosy
- Scientists

Contributors

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Key Messages

Timely recognition and management of reactions can prevent the development of permanent nerve damage and disabilities (and their worsening) among persons with leprosy, which in turn can help them avoid lifelong consequences both physically and in terms of discrimination and stigmatization. More attention should be given to educating patients and healthcare providers on this important aspect of treatment of persons affected by leprosy.

Key Informant / Date Submitted

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Description of the Best Practice

Introduction

Almost half of the leprosy patients worldwide develop immune-mediated complications, which increases the disease burden (1). Immune reactions in leprosy can be paired with severe pain and acute anesthesia and can cause (permanent) nerve injury and deformities (1,2). Reactions can lead to disability and higher levels of stigma (3).

When a leprosy reaction occurs, it is important that it is diagnosed as soon as possible and the patient provided the indicated treatment. However, the detection of leprosy reactions is often delayed (1,2). This can be attributed to the patient as well as to the health services. Patients may not be aware of the

importance of reporting their complaints to the health staff. However, even if they visit the health facilities in time, not all health staff, especially those working in integrated facilities, can adequately recognize and treat leprosy reactions. This delay further increases the development of disabilities among leprosy patients.

Increasing the knowledge of both health providers and patients on the diagnosis and treatment of leprosy reactions will directly benefit the health status of leprosy patients, including their long-term morbidity outcomes.

Objectives and Methodology

The objective of this practice is to continue making people aware of the importance of timely diagnosis and adequate treatment of leprosy reactions, as this is known to prevent disabilities in leprosy patients. The practice described in this document is based on multiple studies that led to the adoption of these practices on a global level. The practice is recognized by the World Health Organization (WHO) and is described in detail by the International Federation of Anti-Leprosy Associations (ILEP) Learning Guides (4-6).

Recommendations made throughout this document are all evidence based, with references given to peer-reviewed articles and to well-respected publications by partners in leprosy elimination.

Implementation of Practice

Recognizing reactions

Reactions can occur before diagnosis as well as during and after treatment with multidrug therapy (MDT). The best practice for early recognition of leprosy reactions is to conduct an examination every time a patient presents him/herself (e.g., upon collection for their monthly MDT dose). In an early stage, a reaction may have started without the patient noticing it (4).

Type 1 reactions result in skin or nerve inflammation at sites of *Mycobacterium leprae* infiltration (1,4). The skin lesions and affected nerves start showing the known symptoms of inflammation, including

- Swelling
- Redness
- Heat
- Pain
- Loss of function

Type 2 reactions have more diverse symptoms, with characteristic painful, erythematous subcutaneous nodules developing (1,4,7). The patient generally feels unwell and reports complaints such as fever and pain caused by lymphadenitis, arthritis, neuritis, iridocyclitis, or orchitis. Type 2 reactions are an important cause of nerve damage and consequent disability.

Table 1: Differentiation between Type 1 and Type 2 Leprosy Reactions (4)

Sign	Type 1 reaction	Type 2 reaction
Inflammation of the skin	The leprosy patches are inflamed, but the rest of the skin is normal.	New, tender, red lumps, not associated with the leprosy patches.
General condition of the patient	Good, with little or no fever.	Poor, with fever and general malaise.
Timing of presentation and type of patient	Usually early on in the course of MDT; people with both PB and MB.	Usually later in the treatment; only people with MB.
Eye involvement	Weakness of eyelid closure may occur.	Internal eye disease (iritis) is possible.

Acute neuritis often occurs during leprosy reactions, in both type 1 and type 2 reactions. It usually starts with spontaneous nerve pain, paresthesia, and nerve tenderness. If not contained or reversed, it may lead to permanent nerve function impairment with objective sensory-motor loss.

A reaction that only manifests in the skin is considered a mild reaction. Reactions that (also) affect the nerves, such as tenderness and loss of sensation/muscle strength, and reactions that affect the eyes or face are considered severe reactions (4).

Clinical observation and tests to diagnose reactions and nerve damage include nerve function tests for both sensory and motor functions of nerves most at-risk in leprosy (4). During the examination, attention must be paid to the following:

- Skin: patches and signs of inflammation
- Nerves: thickness of the nerve, tenderness of the nerves, loss of sensation/strength
    - Palpation of nerves, at least the ulnar nerve, median nerve, and peroneal nerve
    - Sensation testing of hands and feet
    - Muscle strength testing
- Eyes: pain, loss of vision, redness

The results of the examination should be compared to baseline testing, if available. Any new sensory loss or motor loss can mean that a reaction has occurred in the nerves (4,7). This is an indication for direct treatment to prevent disability. Signs of a leprosy reaction found at baseline should also be immediately treated.

Management of reactions

Any patient diagnosed with leprosy should be informed about the importance of complete and regular treatment and the possibility of a reaction. They should also be informed of the symptoms they should report immediately. If a leprosy reaction emerges during MDT treatment, MDT should always be continued (7). Additionally, counselling should take place to inform the patient about additional treatment they may receive such as treatment for possible side effects.

Additional treatment of reactions depends on the type and severity of the leprosy reaction (4):

- Mild reactions (both types)
  - Aspirin (acetyl-salicylic acid) 600 mg up to six times per day or 1000 mg paracetamol up to four times a day (4-6) to reduce pain and fever. Rest is essential for recovery.
- Severe type 1 reactions
  - Corticosteroid should be prescribed (in case of complicating underlying factors, the patient should be treated at the referral level) (4,7). WHO recommends the following dosage (4-6):
    - *40 mg daily for weeks 1 and 2*
    - *30 mg daily for weeks 3 and 4*
    - *20 mg daily for weeks 5 and 6*
    - *15 mg daily for weeks 7 and 8*
    - *10 mg daily for weeks 9 and 10*
    - *5 mg daily for weeks 11 and 12*
  - It is important that the patient is examined every week and that the dose of corticosteroids is reduced every 2 weeks. Maximum dosage of prednisolone is 1 mg/kg of body weight (4-6).
- Severe type 2 reactions
  - Patients with symptoms of severe type 2 reaction should be referred to a specialized health facility for immediate treatment and disability prevention (4,7)
  - The pharmaceuticals for severe type 2 reactions entail the same corticosteroid regimen as a severe type 1 reaction, combined with clofazimine in the following dosage:
    - *300 mg daily for 1 month*
    - *200 mg daily for 3-6 months*
    - *100 mg daily for as long as the symptoms remain* (4)
  - The total duration of clofazimine therapy should not exceed 12 months (7)

Second-line drugs used in the treatment of reactions include azathioprine and cyclosporine, to be used by specialists only. Cyclosporine could be a safe alternative for patients with reaction who are not improving with prednisolone or who are experiencing adverse events related to prednisolone and where azathioprine is not recommended. Evidence from randomized-controlled trials does not show a significant added benefit of surgery over steroid treatment alone. The relevance of prednisolone with respect to dosage and duration needs to be delineated.

Nerve function should be assessed frequently to prevent the development of disabilities during the course of reactions (4). Physical therapy, good care of insensitive hands and feet, appropriate footwear, adequate eye care, and participation in self-care groups can help to prevent disabilities caused by nerve damage (4).

Results—Outputs and Outcomes

Results are based on evidence from peer-reviewed articles and global guidelines. The practice is already widely adopted.

Lessons Learned

If a type 2 reaction cannot be controlled with the above-mentioned pharmaceuticals, thalidomide can be prescribed—by specialists only (4,7). Although many studies have demonstrated the effectiveness of thalidomide in treating acute severe type 2 reactions, its use is restricted in many countries due to its teratogenic effects (4-6).

Replicability and Scalability

The practice has been implemented globally and was adopted by global policy advisors such as WHO and ILEP. The long-term effects of sustained practice include the prevention of disfigurement and disability of persons affected by leprosy. This outcome can increase participation in society and reduce stigmatization for persons affected.

Requirements to sustain the practice consist of adequate knowledge and skills of peripheral health workers in areas endemic for leprosy. Additionally, a specialized health facility for referral should be accessible for persons suffering from severe type 2 leprosy reactions and/or persons with additional complications.

Conclusions

The intervention reduces disease burden, morbidity, disability and disfigurement, and lifelong suffering. This leads to a better health status and a higher participation in society and reduces stigma.

Further Readings

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