Chapter: 8

Leprosy Reaction and its Management

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8.9 Management of person with interruption of steroid therapy
8.10 Assessment of requirement of prednisolone tablets for leprosy reactions
Learning Objectives: At the end of the session trainees will be able to
- Describe criteria and identify early reaction/ neuritis
- Describe high risk PAL for development of reactions
- Describe management of PAL with reaction
- Describe principles of management of neuritis
- Describe monitoring of PAL with reaction/ neuritis
- Enumerate conditions for referral of PAL with reaction

Teaching method – Lecture discussion using power-point Presentation, case demonstration
8.1 Introduction

Though leprosy is a chronic disease, sudden appearance of signs and symptoms occur during reactions. Skin and nerve lesions become inflamed and nerves may become extremely painful and tender due to acute neuritis:

- Occurrence of reactions is one of the characteristics of leprosy
- Long term problems related to leprosy (disability) are due to damage from leprosy reactions.
- Reactions occur due to abrupt change in immunological response of the body against M. leprae. Severity of reaction depends on
  - Presence of bacterial load in the body of PAL
  - Strength of immunological response of the PAL
- Both Pauci-bacillary and Multi-bacillary PAL, have some risk for developing reaction (either type-1 or type-2).
- Leprosy reaction can develop at anytime, at
  - Onset of the disease / before starting the treatment
  - During treatment
  - After completion of the treatment

Patients developing reactions are at a higher risk of developing disabilities and deformities compared to people who do not develop reaction.

8.2 Risk for developing reactions

Though any PAL can develop reaction, some are more prone/ predisposed. People having few skin lesions and no nerve enlargement are at low risk of developing reactions.

Persons with following features are more likely to develop reactions:

- Multiple lesions
- Lesions close to the peripheral nerve (predisposes to neuritis)
- Lesions on the face
- People with nerve thickening with / without functional impairment (including thickening)

Reaction precipitating factors:
- Infections and infestations
- Vaccination
- Hormonal changes: Puberty, Pregnancy & Childbirth
- Psychological stress

These patients should be monitored more frequently for early detection of reaction and its prompt management.
8.3 Types of Reactions

There are two types of Leprosy reactions.

(1) Type 1 Reaction: Also called Reversal Reaction can occur in any patient with unstable CMI
(2) Type 2 Reaction: Also called Erythema Nodosum Leprosum (ENL) occurs in patients with MB leprosy having a heavy load of bacilli

Both the types of reaction can be either mild or severe, clinically.

8.3.1 Type 1 reactions

Occur both in PB and MB leprosy.

- **Cause:** It occurs as a result of increased activity of the body’s immune system, particularly cell mediated immune response fighting the leprosy bacillus or remnants of dead bacilli.

- **Clinical presentation** Reaction may be the first presenting sign of the disease and usually last for few weeks to few months.

- **General condition:** General condition of the patient is satisfactory. Usually there is no fever and patient does not feel ill.

- **Inflammation of skin lesions:** Signs of inflammation are seen in the existing skin lesions i.e. skin lesions become red, more prominent, swollen, shiny and warm. Lesions are usually not painful but some discomfort may be felt. Sometimes, only few patches are inflamed.

- **Appearance of new skin lesions:** Some previously unnoticed or non visible patches may become visible, giving an impression of appearance of new skin lesions. Some or all of these new lesions may be inflamed.

- **Inflammation of nerves:** Nerves are frequently affected in type 1 reaction
  - **Acute Neuritis:** Existing involved or new nerves become enlarged, painful/tender and their sensory, autonomic and motor functions get affected. Pain in the nerve is due to increased intraneural pressure because of oedema and cellular reaction of inflammatory process and gets aggravated when swollen nerve trunk becomes entrapped in bony or fascial tunnel. Pain may even be felt in the region supplied by the nerve (referred pain). Some times, involvement of nerve may be the only presenting feature of reaction without presence of any visible skin lesions.
  - **Silent neuropathy /quiet nerve paralysis:** Sometimes, nerve function may get affected without any pain or tenderness of the nerve or inflammation of skin lesions making it much less obvious. It is seen infrequently. However, these patients need to be identified early and treated with corticosteroids.
Swelling of hands and feet: Swelling of the limbs &/or face may be present.

Eyes: Ocular tissue is not affected in type 1 reactions but patient may develop corneal anaesthesia & lagophthalmos due to involvement of trigeminal and facial nerves. (Refer POD & chapter on ocular leprosy).

Involvement of nerve leads to permanent loss of function resulting in disability. PAL with severe type-1 reactions (see table below) should be identified in early stages and referred to higher centre for management.

**Difference between mild and severe Type 1 reactions**

<table>
<thead>
<tr>
<th>Mild Type 1 Reaction</th>
<th>Severe Type 1 Reactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Occurs in some of the pre-existing skin lesions only (Other than those on face)</td>
<td>- Red, painful, inflamed skin lesions with ulceration</td>
</tr>
<tr>
<td>- Erythema and swelling of skin lesions without ulceration</td>
<td>- Pain or tenderness in one or more nerves with or without loss of nerve function</td>
</tr>
<tr>
<td>- Nerves are not affected</td>
<td>- An erythematos, swollen skin patch on the face around the eye</td>
</tr>
<tr>
<td>- No constitutional symptoms</td>
<td>- Skin lesion overlying major nerve trunk</td>
</tr>
<tr>
<td>- No edema of hands and feet</td>
<td>- Constitutional symptoms</td>
</tr>
<tr>
<td></td>
<td>- Marked oedema of the hands, feet or face</td>
</tr>
<tr>
<td></td>
<td>- Clinically mild reaction not responding to NSAIDs for a period of 2 - 4 weeks.</td>
</tr>
<tr>
<td></td>
<td>- Increased or new muscle weakness noticed (motor loss)</td>
</tr>
</tbody>
</table>

**8.3.2 Type 2 reactions**

Patients having high load of leprosy bacilli as in Multi- bacillary/ infiltrative type of leprosy get type 2 reaction. Type-2 reaction can involve multiple organs & systems, causing generalized symptoms.

**Relation to treatment:** It may occur in the early stages of treatment and even after completion of the treatment with MDT, because body takes a long time to clear the dead bacilli within the macrophages. Type 2 reaction commonly occurs within first three years after the start of leprosy treatment.

**Cause:** It occurs when large numbers of leprosy bacilli are killed, followed by release of their antigens. These antigens from the dead bacilli provoke an arthus type allergic reaction (Coombs and Gell type III hypersensitivity) producing antigen antibody immune complex reaction in the presence of complement system. Immune complexes are precipitated in the tissues (skin, eyes, joints, lymph nodes, kidneys, liver, spleen, bone marrow, endothelium and testes) as well as in the circulation.
Clinical presentation

Type-2 reaction may be the first presenting sign of the disease and usually last for few weeks to several months.

General condition: In the beginning general symptoms like fever, headache and body ache appear before or along with the characteristic nodules that appear on the skin.

Skin lesions: Type 2 reactions exhibit the typical signs of erythema nodosum - red, firm, painful, tender cutaneous and subcutaneous nodules (about 1-2 cm across) and variable sized plaques appear in crops. Nodules blanch on pressure. Usually multiple, they tend to be distributed bilaterally and symmetrically. Nodules are better felt than seen when subcutaneous. They appear preferentially on cooler parts of the skin (found on face and outer surface of limbs and less frequently on the trunk). They usually spare the warmer parts of the body like hairy scalp, axilla, groin and perineum.

Rarely they can break down and suppurate / necrose producing Erythema Nodosum Necroticans (ulcerative ENL). These nodule crops are evanescent, melting away in seven to ten days. When nodules fade these leave bluish/brownish marks followed by brownish hue in the skin. Unlike type-1 reaction, there is no clinical change in the existing leprosy lesions.

Inflammation of nerves: Nerves may also get affected in type 2 reactions.

Differentiating ENL from other diseases: They differ clinically from erythema nodosum seen in other conditions like tuberculosis, streptococcal and viral infections and sarcoidosis, by the fact that the lesions in other cases persist for longer duration (other lesions last up to 7 days) and requires longer therapy, where as ENL lesions of lepra reactions do not last longer than 2 or 3 days.

Eyes: Ocular tissue may get affected in type 2 reactions. It may lead to the development of iritis or iridocyclitis (inflammation of the iris and ciliary body) and impairment of vision. Eye becomes red, watery and painful, pupil becomes constricted and non reactive. Colour of iris becomes dull and patient complains of photophobia (pain in the eye when it is exposed to light). Involvement of eye is an emergency and need immediate referral to higher centre.

Swelling of hands and feet: Often there is non pitting
oedema of face, hands and feet.

Table: Difference between **Mild Type 2 and Severe Type 2 Reactions**

<table>
<thead>
<tr>
<th>Mild Type 2 reaction</th>
<th>Severe Type 2 Reactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Intermittent crops of few ENL</td>
<td>• Red, painful, multiple/innumerable ENL in crops</td>
</tr>
<tr>
<td>• Nerves are not affected</td>
<td>• Pain or tenderness in one or more nerves with or without loss of nerve function</td>
</tr>
<tr>
<td>• Mild fever (less than 100°F) may or may not be present</td>
<td>• ENL that becomes ulcerated (ENL necroticans)</td>
</tr>
<tr>
<td>• No other organs involved</td>
<td>• Accompanied by a high fever (&gt;100°F)</td>
</tr>
<tr>
<td></td>
<td>• Pain and/ or redness of the eyes with or without loss of visual acuity (Involvement of eye)</td>
</tr>
<tr>
<td></td>
<td>• Generalized symptoms with painful swelling of the small joints with fever</td>
</tr>
<tr>
<td></td>
<td>• Recurrent ENL (more than four episodes in a year)</td>
</tr>
<tr>
<td></td>
<td>• Clinically mild reaction not responding to NSAIDs and/or within 2-4 weeks.</td>
</tr>
<tr>
<td></td>
<td>• Enlargement of Lymph glands /testes with pain or tenderness</td>
</tr>
<tr>
<td></td>
<td>• Involvement of other vital organs like kidneys, liver, bone marrow, endocardium, etc.</td>
</tr>
</tbody>
</table>

**Involvement of other organs:** In addition, there may be periosteal pain (especially tibiae), muscle pain (myositis), pain and swelling of the tendons and joints, rhinitis, epistaxis, painful dactylitis, swollen tender lymph nodes especially femoral, acute epididymo-orchitis, hepatosplenomegaly with hepatitis and endocarditis with/without arrhythmia. Presence of protein and red cells in urine are seen in glomerulonephritis that may occur due to deposition of immune complex in renal glomeruli.

ENL reaction may become **chronic** (when the condition persist for more than three months in spite of adequate treatment) or **recurrent** (more than four episodes in a year). It may persist for many months; it may get better and/or worse from time to time. A person with type 2 reaction may feel very ill. If not treated in time, involved organ may get permanently damaged and the patient may even die. Severe type-2 reactions (see table below) should be identified early and referred to higher centre for management.
8.3.3 Clinical Difference between Type 1 and Type 2 reactions

Type 1 reaction is localised whereas type 2 reactions is more generalised. In Type 1 reaction, the skin lesions themselves become inflamed i.e. red and swollen whereas in Type 2 reaction existing lesions remain unchanged and new firm inflamed red nodules about 1-2 cms in diameter appear under the skin. See table below for details.

<table>
<thead>
<tr>
<th>Signs</th>
<th>Type 1</th>
<th>Type 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of reaction</td>
<td>Cell mediated Delayed Hypersensitivity</td>
<td>Antigen antibody (Immune complex), reaction</td>
</tr>
<tr>
<td>Inflammation of the skin</td>
<td>Skin lesions suddenly becomes reddish, swollen, warm, painful/ tender but the rest of the skin is normal, “fresh” lesions may be noticed</td>
<td>Red, painful, tender, cutaneous/subcutaneous nodules appear (not associated with leprosy patches). ENL may appear commonly on face, extensor surfaces of arms and legs.</td>
</tr>
<tr>
<td>Nerve involvement</td>
<td>Nerves close to skin may be enlarged, tender and painful (neuritis) with loss of nerve function (loss of sensation and muscle weakness) and may appear suddenly / rapidly</td>
<td>Nerves may be affected</td>
</tr>
<tr>
<td>General condition (Constitutional symptoms)</td>
<td>Good, with little or no fever or other constitutional symptoms</td>
<td>Poor, with prominent fever and general malaise</td>
</tr>
<tr>
<td>Eye involvement</td>
<td>Weakness of eyelid muscles leading to incomplete closure may occur (nerve involved)</td>
<td>Internal eye disease (iritis, iridocyclitis) occurs, lepromatous nodules are seen.</td>
</tr>
<tr>
<td>Other Organs/Tissues</td>
<td>Not affected</td>
<td>May be affected</td>
</tr>
</tbody>
</table>

8.3.4 Mild & Severe leprosy reactions

Both the type of reaction can be either mild or severe. Presence of one or more of the features mentioned under severe reaction (see earlier tables) means PAL is suffering from severe reactions and needs treatment with steroids and should be referred to higher medical centre identified for the purpose.

8.4 Diagnosis & examination of the person with lepra reaction

To prevent disabilities and deformities in leprosy
Diagnose reactions and treat them promptly

Leprosy reactions are diagnosed by clinical examination (described above). Whenever leprosy affected person is examined, ask for symptoms related to inflammation of skin
lesions, presence of cutaneous nodules, pain and tenderness of the nerve, pain & redness in the eye, weakness in hand and feet and inability to close eyes completely.

8.4.1 Differential Diagnosis
Common conditions that can be confused with reactions are:

- **Cutaneous drug reaction**: May present variably as exanthemata, urticarial, lichenoid, Erythema nodosum like, Erythema multiforme, Stevens-Johnson syndrome or as Toxic epidermal necrolysis. In some of these reactions the patients complain of itching or burning that is not seen in leprosy reactions. The fresh eruptions do not correspond to pre-existing skin lesions.

- **Local infection**: Localized pyoderma that develop in leprosy patients are usually limited to one part of the body and history of cause of infection like injury or insect bite is usually elicitable.

- **Relapse**: Reaction usually occurs within 3 years of starting anti leprosy treatment and is acute in onset with pain and tenderness of the old lesions. In relapse new lesions appear and are insidious in appearance (see table given earlier).

- **Other medical conditions:**
  - **Diabetes**: Diabetics are prone to infections as well as development of peripheral neuropathy. Further, if given corticosteroids the blood glucose tends to go out of control. All patients should be screened for diabetes and if diabetes is detected, the patient should be referred to an approved higher centre for further evaluation and management.
  - **Bell’s palsy**: This condition can mimic facial palsy caused by leprosy reaction. These patients do not have nerve thickening and/or anaesthetic and/or hypopigmented skin lesions. This condition is better managed by an ophthalmologist. In bell’s palsy widening of palpebral fissure is not due to sagging of lower eyelid
  - **Rheumatoid arthritis**: This condition can present in women of reproductive age group with skin eruptions, fever, joint involvement, deformities and multiple organ system involvement. RA factor is detectably raised almost invariably. However, sometimes differentiation of this condition from leprosy reaction may require referral to higher centre.

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**Consider Reaction on**

- Sudden appearance of symptoms
- Inflammation of existing skin lesions (type-1 reaction) or appearance of painful tender nodules (type-2 reaction)
- Inflammation of nerves
- Involvement of ocular tissue
- Swelling of hands, feet and pain in small joints
• **Rheumatic fever:** Patients may develop fever with joint pains and transient skin rash usually in a young patient. ASLO titre will be raised and cardiac valvular involvement may result in detectable murmurs. These patients require consultation/management by specialist.

• **Disk prolapse:** Patient may present with acute onset neuropathy of lower limbs. Patient usually gives history of straining the back or lifting heavy object before the onset. These patients will not have any skin lesion or thickened nerves. They should be managed by an orthopaedic specialist.

### 8.4.2 Early diagnosis of reactions

Take the following steps for early diagnosis and prompt treatment of leprosy reactions to prevent development of disability.

- Diagnose leprosy early and treat with MDT.
- Build capacity of the staff to enable them to identify & refer PAL with reactions
- Counsel PAL and family members regarding importance of regular and complete treatment
- Educate PAL and family member for signs and symptoms of reaction & neuritis and ask them to report immediately on appearance of these signs and symptoms
- Retrieve the defaulter as soon as possible.
- Monitor and frequently examine high risk persons on monthly interval and others after every three months for early detection of reaction and nerve damage
- Timely treatment of reaction and appropriate referral helps in prevention of disability due to leprosy

Examine the person with reaction thoroughly to assess the extent of involvement of various systems (refer diagnosis) and decide whether the reaction is mild or severe in type.

Those at risk of developing reactions or with thickened nerves without any pain / tenderness/functional impairment are registered for treatment with MDT (if not taken previously), counselled to report immediately on earliest sign of development of reaction and monitored closely.

### Principles of Management of mild reactions

- Anti leprosy drugs to be continued as earlier
- Counseling to relieve stress
- Treatment of inter-current infections and infestations
- Analgesic, anti-inflammatory drugs (NSAIDS)
- Anxiolytics (at bedtime)
8.5.1  **Management of mild reactions**
Mild reactions are treated symptomatically without steroids. Treatment includes:

- **Reassurance**: Patient is reassured that it will subside within few weeks with medicine.

- **MDT**: Start MDT, if person has come for the first time & MDT not taken previously. People still on anti-leprosy treatment (MDT) must continue their treatment. However, those who have completed their course of MDT do not need anti-leprosy treatment while on treatment for reaction.

- **Analgesics and Anti-inflammatory agents**: Mild cases of both the types of reactions are treated symptomatically with NSAIDs like Aspirin (Adult dose 600 mg which can be given upto six times a day)/ Paracetamol (adult dose 1 gm up to four times a day).

Reactions, which are mild (show no signs of severity) and are limited to mildly inflamed skin lesions may be treated symptomatically with Aspirin/Paracetamol.

8.5.2  **Management of severe reaction**

If any of the features of severe reaction (see earlier tables) are present, treatment with steroids is required. **Management of severe reaction** includes:

- **Bed rest**: Admission and bed rest for two weeks or more (as required).

- **Rest to the affected nerve using splint**: Rest to the affected nerves is provided by use of static splint. Splint is applied involving joint in the vicinity of the affected nerve. It prevents injury to the affected nerve that may occur due to repeated movement of the joint. While applying splint, affected portion is kept in the functional position. Splint is applied for 24 hrs and removed only for exercise. Initially, person is assisted to carry out gentle passive exercises for the splinted joint where as rest of the adjoining joints are moved twice a day with full range of movement to avoid stiffness. When acute phase is over i.e. pain and inflammation subsides (recovery begins), passive exercises are started to maintain the range of movement of all the adjacent joints. Later, even if there is some permanent nerve damage, active exercises are started to restore strength of the affected muscle.
**Functional positions for splinting**

<table>
<thead>
<tr>
<th>Nerve</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ulnar nerve</td>
<td>Elbow flexed to an angle of 90°</td>
</tr>
<tr>
<td>Median nerve</td>
<td>Wrist extended to 40°</td>
</tr>
<tr>
<td>Common peroneal nerve</td>
<td>Knee flexed to 10°</td>
</tr>
<tr>
<td>Posterior tibial nerve</td>
<td>Ankle in neutral position of 90°</td>
</tr>
</tbody>
</table>

**Analgesics:** Analgesics are given as required as described above.

**Prednisolone:** The main drug for the treatment of severe reactions is corticosteroids

- It relieves pain and inflammation in the nerve and the skin. Reduction in pain, tenderness & oedema helps in gradual restoration to normalcy. It is easily absorbed when taken orally. It is a very effective drug and its affect starts in a few days. It should never be stopped abruptly.
- The usual adult dose of steroids to begin with, is 1 mg/kg of body weight to immuno-modulate the reaction. Duration of treatment is 12 - 24 weeks depending on the severity of reaction and response to the therapy.
- If inflammation of skin & nerve subsides and there is no new nerve involvement, the dose of Prednisolone is gradually reduced at fortnightly interval depending on the response and eventually stopped (see table).
- In case of neuritis, (inflammation of peripheral nerve trunk) the period of treatment is prolonged according to the response. From 20 mg onwards (in table below), duration of each dose is increase to 4 weeks.

**Prednisolone is given in the following regime/doses:**

**Note:** Treatment with prednisolone is not linked to MDT i.e. It can be given after adequate MDT is given and stopped.
(i) Start Tab. prednisolone dose at 1 mg/kg body wt/day given as a single morning dose after breakfast (consider giving tab ranitidine 150 mg along with prednisolone)

(ii) After the reaction/inflammation is controlled, prednisolone is tapered by 10mg, fortnightly till the dose of 20mg/day

(iii) Thereafter prednisolone is tapered by 5 mg/day, fortnightly till withdrawal.

8.5.3 Management of severe type 2 reaction
Type 2 reactions can often last for many months so there is a risk of people becoming dependent on steroids. It becomes difficult to taper steroids and eventually stop the treatment. These patients should be managed in higher referral centers where admission of the patient is possible. Persons who suffer from persistent ENL or who can not be weaned from steroids need drugs other than Prednisolone like higher doses of clofazimine and/or thalidomide for the management of the reaction. Treatment with thalidomide is only recommended in tertiary care hospitals after taking necessary consent. Since this drug is teratogenic, it is contraindicated for use in women of reproductive age group.

Clofazimine is given with corticosteroids in every case in the following regime:

<table>
<thead>
<tr>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>One capsule (100mg) 3 times a day x 12 weeks</td>
</tr>
<tr>
<td>One capsule (100mg) 2 times a day x next 12 weeks</td>
</tr>
<tr>
<td>One capsule (100mg) once a day x next 12 wks</td>
</tr>
</tbody>
</table>

Though Clofazimine is less potent than steroids and often takes 4 – 6 weeks to develop its full effect; it is extremely useful in reducing or withdrawing corticosteroids in patients who have become dependent on them. Total duration of clofazimine therapy should not exceed 12 months.

8.5.4 Recording steroid treatment
Information regarding Leprosy reaction and details of steroid therapy are filled in leprosy reaction/ neuritis form (form P-III) kept at the PHC, to monitor the nerve function by comparing the current findings with that of the previous visit. If steroids are being given, record the details in the Leprosy Treatment Register and on the Patient Record Card by red ink. To ensure regularity of the treatment, in people on steroid therapy, who have completed course of MDT, add their names in the treatment register with old registration number in red for the duration of the steroid therapy. Details of the referred person must be recorded in the register (P - V).
8.5.5 Treatment with surgery

Presence of abscess along the course of the nerve needs surgical intervention at referral centre:
In some cases of neuritis, despite treatment with steroids for 2-4 weeks; pain persists and there is no improvement in motor function of the involved nerve. To relieve nerve pain and restore nerve function in such cases, nerve pressure is relieved by surgery called nerve decompression. Nerve decompression can be done at referral centre if facilities are available.

8.5.6 Counselling of person in reaction - Refer section 11.6

8.6 Precautions during treatment with systemic Steroids

Before starting treatment with steroids take a detailed history and examine the person thoroughly to exclude conditions that are likely to worsen. Treatment for some of these ailments like worm infestation, diarrhea, dysentery, conjunctivitis, fungal infection, scabies and epigastric pain must be started along with the steroids. Persons with conditions like diabetes, hypertension, presence of any infection, red eye, ulcer, osteomyelitis, tuberculosis, and severe depression are referred to higher centre before starting steroid therapy because they need additional resources, precautions and close monitoring during steroid therapy. 

**Pregnant females and children under 12 years of age also need close monitoring during steroid therapy (Refer Annex VI).**

**NOTE:** When there are no contraindications to steroids, Mebendazole is given to treat any worm infestation (if not taken during the last six months) and steroids are started.

8.6.1 Monitoring of patient for side effects of prednisolone

Side effects of prednisolone therapy can be serious and sometimes even fatal. Before starting the treatment with steroids, exclude medical conditions that make a person more vulnerable to side effects of steroids and refer such patients to identified referral centre for management.

**Person with recent nerve damage not having any of the above mentioned conditions (requiring referral) can be treated with steroids at PHC.**

Exclude the following before starting prednisolone (and also monitor after starting steroids):

- Hypertension,
- Diabetes,
- Peptic ulcer,
- Osteoporosis,
- Growth retardation,
- Cataracts/ Glaucoma,
- Weight gain and/or pitting oedema.

If any of these above conditions are present or suspected, refer the patient to identified referral centre for management.
8.7 Counselling PAL in reactions / steroid therapy

8.7.1 Counselling patients at start/during steroid therapy

Patients on steroids must be counselled regarding reason for treatment, duration of treatment importance of complete and regular treatment, not to stop treatment abruptly on their own, possible side effects, conditions when they must report immediately.

These PALs should report to the PHC fortnightly for clinical review and delivery of prednisolone.

8.7.2 Counselling patients & follow-up on completion of treatment with steroids

- People who have been given a course of steroids for reactions or nerve damage are at a greater risk of recurrence of reactions and damage to other nerves. They must be followed closely. Tell all patients that they must report immediately to the PHC/ treatment centre; whenever they see any change or recurrence of similar episode.
- People who have not developed reaction but are at high risk of developing reaction must be made aware regarding the condition for which they must report immediately and may be asked to come every three months after completion of MDT course for the next one year.
- Counsel and train the person and one of the family member in self care (Refer POD)
- People who still have lag-ophthalmos (weakness of eyelids) should be referred to a specialised centre.

8.8 Referral of patient in reaction

Patient may need referral before starting the steroid therapy or during the treatment

8.8.1 Referral before starting treatment with steroids

- If a patient has any relative or absolute contra-indication for steroid therapy he/she should be referred to the appropriate referral centre.
- Eye involvement: must be referred immediately because it may lead to impairment of vision and even blindness.
- Type – I reaction that occurs after completion of the treatment, must be referred and managed at the referral centre.
- Nerve Abscess: Start anti inflammatory drugs/corticosteroids, provide splint and refer the person.

8.8.2 Referral during steroid therapy

- Patient with neuritis is also referred if condition of the patient does not improve after two weeks of steroid therapy.
- Condition of the patient worsens at any time during treatment.
- Patient develops side effects of steroid therapy that cannot be managed at PHC
8.8.3 Referral after completion of treatment with steroids

People who still have persistent lag-ophthalmos (weakness of eyelids) after completion of treatment with steroids are again referred to a specialised centre.

While referring the person, details are noted in the referral register; this would be helpful in keeping the track of the referred person and in providing follow up services to the person according to the guidelines from the referral centre. Person is also given a referral slip with details of the condition and their treatment. Person would be referred back with details of the follow up treatment required for the concerned person.

See referral system chart in annexure II.

8.9 Management of person with interruption of steroid therapy

Some times, patient may not come back for next dose of steroid therapy, try to retrieve the patient with the help of the health worker. Explain the importance of continuing the therapy. When ever patient returns after interruption in the steroid treatment:

- Assess the nerve function.
- Irrespective of the duration of interruption of steroid therapy; management of reaction depends on the condition of the patient:
  - If the original problem does not exist (no sign of reaction/ impairment of nerve function). Stop the steroid treatment.
  - If nerve damage of less than six months duration and/or sign of reaction still persist, restart the whole course of steroids. Make sure that the person understands the importance of completing the course without interruption.
  - If the nerve damage has worsened/ duration of nerve damage is for more than six months, restart the course of steroids and refer the patient to higher centre.

8.10 Assessment of requirement of prednisolone tablets for leprosy reactions

Medical officer needs to indent the prednisolone tablets for the health centre. To calculate the required number of prednisolone tablets

It is estimated that nearly 1/3 of the newly detected cases in the preceding year will require steroids and total number of 5mg tablets of prednisolone required is 336 for recommended standard 12 weeks schedule – starting with 40 mg/day.