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Case Report

Geriatric Leprosy: Two Cases of new onset Leprosy above 80 years of age

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Leprosy is a disease that typically affects adolescents and young adults. However, with India's ageing population, there is likely to be a rise in geriatric leprosy. Currently, there is only one other published case of geriatric leprosy. Here, we describe two cases of leprosy, which were first diagnosed above the age of 80 years. We discuss the diagnostic challenges and treatment considerations unique to leprosy in the elderly patient. Specifically, initial presentations of neuropathy may be falsely attributed to other conditions such as diabetes. In addition, clinicians should consider tailoring the dosage of multi-drug therapy (MDT) in these group of patients to avoid drug-related toxicity.

Keywords : Geriatric leprosy, Hansen's disease, Elderly

Introduction

Leprosy is known to mainly occur during two different periods of life - in children aged between 10-14 years old, and in young adults aged between 35-44 years old (WHO 2016). However, people of all ages, from early infancy to the elderly, are still susceptible to the disease (WHO 2016).

With the persistence of leprosy, coupled with India's ageing population, we speculate that there may be an increase in first presentations of leprosy being detected in the elderly. Kumar et al have reported that the new case detection rate (NCDR / 10,000 population) in Haryana and Uttar Pradesh has showed an increasing trend from 0.96 in the youngest age group, to 20.72 in individuals aged 60 years and above, between 2009–2010 (WHO 2016). However, it is important to consider the reliability of the data, especially as the rural regions are often out of reach to local authorities (Rodrigues & Lockwood 2011). Aside from a 141-year-old Nepalese gentleman

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(Oommen 2000, Shatrughan 1999), this is the only other report, to our knowledge, of new cases of leprosy being detected at above 80 years of age.

In this case report, we discuss two cases of newly diagnosed leprosy at above 80 years of age, alongside the potential challenges faced in the diagnostics and management of these patients.

Case report 1

An 82-year-old Indian gentleman presented with a 2-year history of a skin plaque on his left arm. He had no previous leprosy, denied having any close contacts with leprosy and was otherwise healthy. Physical examination revealed a 10 x 5 cm hypopigmented, hypo-anaesthetic patch, with occasional raised erythematous margins, overlying the extensor surface of the left arm. There were no other systemic signs of leprosy, and nerve function was fully intact.

Smear samples taken revealed a bacteriological index (BI) of 0+ at all sites. Histopathological analysis of a biopsy sample of the left arm revealed skin and subcutaneous tissue with marked epidermal atrophy. The dermis and subcutis contained granulomas composed of epithelioid cells, occasional giant cells and lymphocytes with a granuloma fraction of about 40%. The infiltrate eroded the epidermis in foci, and there was perineural and intraneural malformation. Acid-fast bacilli (AFB) were not seen.

Considering the clinical and histopathological findings, a diagnosis of paucibacillary (PB; WHO classification), borderline tuberculoid (Ridley-Jopling classification) leprosy was made. Accordingly, the patient was commenced on paucibacillary - multidrug therapy (PB-MDT), comprising of Rifampicin and Dapsone. Vitamin and mineral tablets were also prescribed as supplements.

He was incidentally diagnosed with iron deficiency anaemia, attributed to malnourishment and his age. Malnutrition is a known risk factor of leprosy. Furthermore, haemolysis is a known side effect of Dapsone. As such, it is important that the full blood count is closely monitored, to ensure that side effects are detected early, and promptly treated.

Case report 2

An 80-year-old gentleman presented with a 1-month history of generalised muscle weakness and associated swelling over both feet. He had not been diagnosed with leprosy previously, and it is unclear whether he had any close leprosy contacts. He has no other pre-existing co-morbidities, has chewed tobacco for 50 years, and drinks. Physical examination revealed multiple hypopigmented, hypo-anaesthetic patches overlying his forearm, buttock and thigh, with diffuse infiltration. There was also clawing of the right hand, with evidence of intrinsic muscle wasting bilaterally. Bilateral foot ulcers with swelling were also present, overlying the dorsum of the left foot and on the right great toe. Eye function was normal. Motor examination demonstrated bilateral hand weakness (in the ulnar and median nerve distribution) and bilateral foot drop. There was a loss of sensation on monofilament testing in the bilateral hands, which was thumb sparing, and in both feet.

Smear samples taken from the left buttock revealed an average BI of 2.5+. Histopathological analysis revealed epidermal atrophy of skin and subcutaneous tissue, with small granulomas composed of macrophages and lymphocytes (granuloma fraction of about 20%) in the dermis and subcutis. Evidence of nerve infiltration was present, and a grenz zone was seen. Beaded, fragmented and solid bacilli were present in the granulomas with bacillary index in granuloma (BIG) of 5+.

Accordingly, a diagnosis of multibacillary (MB; WHO classification) lepromatous leprosy (LL; RJ classification) was made, and MB – MDT was commenced. Additionally, as nerve impairment had been present for less than 6 months, he was treated with prednisolone.

Similar to case 1, this gentleman was also incidentally found to have iron deficiency anaemia, for which he was given folate and iron supplements. Multivitamins were also prescribed as supplements.

Discussion

The significance of this case series of leprosy in the elderly is threefold (Box 1):

1. Diagnostic challenges
2. Identifying whether underlying immunosuppression contributed to the infection
3. Pre-empting and monitoring for complications from disease and from MDT

Summary of key considerations of leprosy in the elderly

A diagnosis of leprosy may be overlooked in elderly patients as there are many common differentials that would be considered first. Ngan (2003) suggests that 90% of leprosy patients first present with numbness, which may precede skin lesions by a few years Mononeuritis multiplex and peripheral neuropathy may be falsely attributed to diabetes mellitus, particularly in such endemic countries like India. Additionally, differentials for hypopigmented skin patches include post-inflammatory and post-traumatic hypopigmentation, steroid-induced tinea incognito, or sarcoidosis (Oakley 2014). In particular, early

Key considerations of leprosy in the elderly

Diagnosis

- Leprosy may be overlooked as other differentials (e.g. diabetes), which are more common in the elderly may be considered first.

Investigations

- Is this a primary leprosy infection, or a reactivation of latent infection?
  - ✧ If the latter is true, is there any underlying immunosuppression?

Management

- Consider tailoring drug dose to patient's age, body weight and lean body mass (Oommen 2000)
- More frequent monitoring for complications

Complications

- <u>Leprosy related complications</u>
  - ✧ Whether type 1 or 2 reactions are more common in the elderly has yet to be established.
  - ✧ Multiple comorbidities may affect ability to self-care, and hence lead to an increased risk of complications associated with chronic ulcers like cellulitis, osteomyelitis and falls.
- <u>Complications from MDT</u>
  - ✧ Increased risk of side effects and drug toxicity due to the following factors:
    - ❖ Age related decline in hepatic and renal function
    - ❖ Polypharmacy
    - ❖ Pre-existing comorbidities

borderline lepromatous patients can be difficult to differentiate from early vitiligo. However, when hypopigmented skin lesions are associated with anaesthesia, this is patho-gnomonic of leprosy.

Secondly, although more than 95% of the world population are naturally immune to leprosy, it is plausible that underlying immunosuppression in patients previously colonised with leprosy might result in reactivation of a latent infection, hence their later presentation (Bennett et al 2008, Scollard et al 2006, WHO 2011). Conversely, unlike other diseases caused by mycobacterium, leprosy is traditionally less affected by immunosuppression, possibly due to the low virulence of *M. leprae* (Trindade et al 2011). Interestingly, co-infection of leprosy with HIV is not only rare, but paradoxically, does not adversely affect the outcome of leprosy (Galtrey et al 2017). On the other hand, due to the long incubation period of *M. leprae*, HIV patients may die before leprosy becomes clinically apparent, especially as leprosy is associated with poverty and such patients may struggle to access healthcare (Lucas 1993, Scollard et al 2006). Nevertheless, there is still evidence suggesting immunosuppression could indeed play a role. Some evidence suggests that the use of monoclonal antibodies like infliximab has resulted in the reactivation of *Mycobacterium leprae* (Date et al 1998, Vilela et al 2009, Wallis et al 2004). Furthermore, leprosy has been documented in heart, renal and liver transplant recipients (Date et al 1998, Gasink et al 2006, Trindade et al 2011). Hence, it is important for clinicians to identify underlying immunosuppression, and initiate prompt treatment, particularly in elderly patients newly diagnosed with leprosy.

Lastly, geriatric patients are likely to be at greater risk of both complications associated with leprosy and its treatment.

Type 1 reactions can be common in patients with borderline leprosy. They develop gradually and last several weeks. Existing lesions may indurate, become erythematous and ulcerate. Severe type 1 reactions are considered a medical emergency, as complications of nerve injury, deformity and paralysis adversely affect the quality of life (Scollard et al 2006). This is pertinent in elderly patients, who may already struggle to self-care due to pre-existing co-morbidities, and who are at further risk of developing chronic ulcers, and consequently cellulitis and osteomyelitis due to impaired wound healing. Moreover, complications of nerve injury such as foot drop further increases the risk of falls and their mortality.

Type 2 reactions are more common in MB patients. However, whether the reactions are more common in elderly leprosy patients, whatever the type, is yet to be established. Type 2 reactions result in systemic symptoms due to dissemination of the disease, and most patients will experience recurrence of this reaction over many months (Scollard et al 2006). An elderly patient with a type 2 reaction may be more susceptible to developing complications such as acute kidney injury, as a result of dehydration from pyrexia, diarrhoea and vomiting.

It is common knowledge that drugs used in MDT have dose-related side effects. Due to a decline in tissue perfusion with age-related atherosclerosis and other comorbidities, hepatic drug metabolism and renal drug elimination are reduced. Consequently, side effects and drug toxicity are more likely to present in elderly patients on MDT. Yet, studies relating to the safety of MDT have not been convincingly documented. Oommen has suggested the use of a safer alternative regimen comprising of rifampin-ofloxacin-minocycline, which can be customised based on the patient's age, body weight and lean body mass (Oommen

2000). Age-related complications that could arise from MDT need to be better understood and managed, and incorporated into guidelines specific for the use of MDT in geriatric patients.

Current epidemiological data published by the World Health Organisation (WHO) does not reflect the age distribution of leprosy in India (World Health Organisation 2017). This case series highlights the need for further epidemiological studies on the incidence of leprosy in different age groups to be undertaken.

Conclusion

In all, leprosy remains a poorly understood disease, and whether the patients in question developed leprosy because of reactivation of the infection, or newly acquire the infection because of their advanced age, is debatable. Additionally, as elderly patients with leprosy remain a rarity, issues with MDT and reactions need to be further investigated, but it is safe practice to bear them in mind when managing these patients.

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