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Letter to the Editor

MYCOBACTERIAL INFECTIONS CAUSING CUTANEOUS DISEASE; OR HOW IS LEPROSY TRANSMITTED?

Armauer Hansen showed in 1873 that *M. leprae* was the pathogenic agent for leprosy. Leprosy was the first infectious disease in which the causal relationship between a micro-organism and a disease was established. However, Koch's postulates have not been fulfilled for leprosy.

Unlike most other infectious diseases the mode of transmission for leprosy is still under debate. Most leprologists would support, or at least suggest, that the most *likely* route for infection is airborne by way of the upper respiratory tract. This seems logical because of the abundance of *M. leprae* in nasal discharge from lepromatous leprosy patients, and the evidence that *M. leprae* is discharged in the environment through sneezing and coughing.[1]

Some authors, without referencing, would state as a fact that '. . .the most important port of entry and exit of *M. leprae* is the respiratory system, particularly the nose; its dissemination through skin lesions seems to be less important'.[2] Other authors are a bit more cautious: '. . .*M. leprae probably* enters the body via the nose and then spreads to the skin and nerves via the circulation'.[3]

If *M. leprae* does not enter the body by way of the upper respiratory tract what then could be a likely port of entry and source of infection? In a recent article Argaw *et al.* state that '. . .alternative sources of *M. leprae* infection could be sub-clinically infected individuals, a vector or environmental contamination'.[4]

Naafs *et al.* pointed out that the skin might be important as a port of entry of *M. leprae*.[5] Ghorpade, focussing on the skin as port of entry showed that tattooing could transfer *M. leprae*, in this way providing strong support for one of Koch's postulates.[6] In a recent case report the transmission of leprosy was reviewed and attention was drawn to the possible association of abraded traumatised skin and a first leprosy skin lesion.[7] In another study the same author reports on the association between single skin lesions in proximity to, or overlying, a nerve which is also strongly suggestive of the point of entry being the skin near or distal to the innervation site of the peripheral nerve.[8]

Several other Mycobacterial infections, including tuberculosis, occur in the skin and are transmitted through abraded skin.[9–11] Why should leprosy be an exception?

Three recent case reports support skin transmission as a portal of entry:

Case 1: A surgeon in Germany contracted localised leprosy a few years after a cut he had sustained in the process of performing a diagnostic skin and nerve biopsy on a patient. The result of the biopsies showed that the diagnosis of the patient was lepromatous leprosy. The biopsy of the surgeon a few years later confirmed that he had contracted localised leprosy at the site of the accidental cut on the dorsum of his hand. Could transmission of leprosy by the

upper respiratory tract in this case be excluded considering the surgeon wore a surgical mask?[12]

Case 2: A gynaecologist from Brazil developed a single lesion on her right middle finger. Following a pregnancy she developed weakness of the median nerve supplied muscles and the skin lesion became inflamed. Biopsies confirmed tuberculoid leprosy. Could this MD have sustained a minor injury/abrasion of the skin through which *M. leprae* entered the body causing initially a skin lesion and that by 'migration' proximally, and through the pregnancy, developed a localised 'reaction' or is it more likely that *M. leprae* entered the body by inhalation and selectively chose to make home in one middle finger only?[13]

Case 3: A women in the state of Georgia, United States, was diagnosed with leprosy. She had never been in a leprosy endemic country. There were armadillo burrows in her yard. Armadillos are known to host *M. leprae*. Did she meet with a sneezing or coughing armadillo or is it more likely that discharged *M. leprae* from the armadillo in her yard entered her body through abraded, bruised, skin?[14]

The authors do not deny the upper respiratory tract as a port of entry but would like to oppose the strong statements that leprosy is transmitted only through the upper respiratory tract, leaving at least the possibility open for abraded or damaged skin to be another, likely port of entry.

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