tine baseline investigations do not belong to modern invasive sophisticated techniques. It would have been unethical not to treat only because of the advanced age. Moreover, he was slit-smear positive and would have continued the spread of infection in the society since so many people visited him daily for his blessing. We treated definitely in the hope that he would be cured. Therefore, we are fully justified in treating this patient. The criticism regarding treating this patient with World Health Organization multidrug therapy (WHO/MDT) by Dr. Lechat raises a very pertinent question of whether elderly patients with leprosy should be treated at all and, if yes, with which MDT? In spite of knowing of his treatment he was not disowned by his family and had been well looked after. So in modern times the idea has been changed.

In the year 2000, when WHO is making an all out effort to eliminate leprosy, we firmly believe that all patients documented to have leprosy must be treated with WHO/MDT, irrespective of their ages. However, the safety of the drugs should be considered when treating any geriatric patient.

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Multidrug Therapy in Geriatric Patients

TO THE EDITOR:

While several publications are available worldwide on the efficacy and safety of the World Health Organization multidrug therapy (WHO/MDT) ([1]) program, little has been reported on the safety of MDT in geriatric patients. The case report of the 141-year-old gentleman from Nepal, who had become symptomatic for multibacillary (MB) leprosy, should now stoke an interest in the chemotherapy of leprosy in èlderly patients.

Since MDT for MB leprosy involves just once-a-month supervised therapy with clofazimine and rifampin and a daily dose of dapsone and clofazimine, the problem of patient compliance is not as great as one would otherwise imagine. Geriatric patients run the risk of adverse effects to drugs far more than younger patients. It is common knowledge that all of the drugs used commonly in the treatment of MB leprosy have side effects which are dose-related, some side effects being more tolerable than others. But where tissue perfusion is compromised due to senile and atherosclerotic changes, where drug metabolism is retarded due to changes in hepatic cytoarchitecture, where drug elimination is reduced due to senile changes in renal function, drug toxicity (due to cumulative toxicity, reduced protein binding and drug interaction) becomes much more likely and the chemotherapy of leprosy needs to be reconsidered seriously.

While it is absolutely unethical to treat leprosy patients (irrespective of their age) with monotherapy, it is equally unethical to respect their age and leave them untreated. One alternative to this conundrum could be the refampin-ofloxacin-minocycline (ROM) therapy, perhaps with a single dose. If a modified ROM therapy can be customized, keeping in mind the age of the patient, body weight and lean body mass, the safety index would be even better.

The patient in question expired after 2 weeks of antileprosy treatment. This meant that he had been administered a total of 600 mg rifampin, 1000 mg of clofazimine and 1200 mg of dapsone, much of which would have still been retained in his body at the time of his death. Just as much as his death may have been due to cardiac failure secondary to age, it might also have been precipitated by severe abdominal cramps

caused by clofazimine or psychiatric or hematological changes caused by dapsone.

Since studies on the safety of MDT in geriatric patients have not been documented convincingly, it is suggested that such reports be made available, at least on the basis of retrospective analyses. With the changing scenario of leprosy globally, a multi-disciplinary approach to chemotherapy should be continued if the global elimination of leprosy is to be achieved.

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REFERENCE

1. AGRAWAL, S., JOSHI, A., JACOB, M., SAH, S. P., AGARWALLA, A. and GARG, V. K. Leprosy at the age of 141 years: a case report. Int. J. Lepr. **67** (1999) 471–472.

A Study of the Biology of *M. lufu* and Prospects for Using It in Leprosy Investigations

TO THE EDITOR:

Although presently a possibility of acquiring leprosy infection from various sources (from nine-banded armadillos, mangabey monkeys, etc.) is proved, yet a patient with leprosy is considered the main source of infection of epidemiological significance.

But such postulates do not give answers to a lot of questions posed by practical leprology: cases of spontaneous leprosy when the source of infection is unknown; prevalence of lepromatous type of leprosy on the territories with fading endemic. It is difficult to explain occurrence of leprosy infection in wild nine-banded armadillos in the USA and mangabey monkeys in Zaire and to ascertain the role of these animals in maintenance of the infection on the above territories. Ways of transmission and entry for *Mycobacterium leprae* infection as well as the causes of persistence of leprosy endemic regions also remain unclear.

At the end of the 19th century a hypothesis of acquiring leprosy infection from the environment was put forward by Biedencap, Beaven-Rack and Lutz ([4]). Our studies were based on the assumption that leprosy bacilli are a part of the biosystem of a given region (contrary to the generally accepted view of obligate intracellular parasitism of *M. leprae*). In order to validate this hypothesis a series of investigations was carried out using *M. lufu* isolated from the soil by Prof Francoise Portaels. *M. lufu* are able to grow on the artificial nutrient media and show sensitivity to sulfones similar to that in *M. leprae* ([3]).

In vivo experiments with introduction of *M. lufu* into mice foot pads (Shepard's method) ([6]) showed a significant growth of *M. lufu* cultivated on Levenstein-Jensen medium. Intraplantar multiplication of mycobacteria was inhibited by dapsone administered to mice in their diet. Mice infected with *M. lufu* against the background of introducing synthetic tetrapeptide tuftsin showed a generalized infection involving internal organs like human lepromatous leprosy and lepromatoid disease in armadillos ([7]). The most marked changes were mainly observed in lungs, spleen and liver.

Histological investigation showed infiltrates around splenic lymphatic follicules and red pulp. The infiltrates consisted of fused granulomas presented by large macrophages with pale eosinophilic cytoplasm and a small, bean-shaped, basophille nucleus. There were numerous acid-fast bacteria (AFB) and fuchsinophilic grains in macrophage cytoplasm. Similar granulomas were observed along central veins, in the stroma of portal tracts and in the middle zones of hepatic lobes. Besides macrophages, granulomas included a few lym-