Rational use of laboratory test

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Sir,

We read the editorial on "Rational use of laboratory tests in dermatology" with great interest.[1] In this article, the editor discussed the way to properly use and interpret several laboratory tests. We would like to share ideas on this issue. Rational use of laboratory investigation is an important consideration in laboratory medicine. Rational use basically means proper investigation and correspondingly proper interpretation of results. The physicians must know the concept of the test and how to interpret the result of the test. Also, the commonly forgotten issue is the preparation of the patient for getting the test. In laboratory medicine, pre-analytical error is common and it is sometimes related to poor preparation of the patients.[2] Quality assurance to control the laboratory error is usually needed. Nevertheless, rational use of laboratory test also means selection of the test that is cost-effective and affordable to the patient.[3] In addition, the availability of the analysis and the turnaround time of the analysis are also matters of concern. Some tests might be useful but not available or have very long waiting time for the results, which is not appropriate for the requirement for prompt management of the problem. In conclusion, there are several considerations in clinical practice for the dermatologists to have rational use of laboratory tests in their clinical practice.

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There are no conflicts of interest.

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Prevention of *Strongyloides stercoralis* hyperinfection in leprosy patients on long-term steroid therapy

Sir,

We read with interest the article entitled "*Strongyloides stercoralis* hyperinfection: An often missed but potentially fatal cause of anemia and hypoalbuminemia in leprosy patients on long-term steroid therapy" by Gupta *et al*.[1] Through this case discussion, the authors emphasized the need for awareness of this often fatal syndrome among dermatologists and leprologists who frequently prescribe corticosteroids for managing lepra reactions. The authors have pointed out that unexplained peripheral eosinophilia in an immunosuppressed individual having abdominal or pulmonary symptoms should raise a suspicion of strongyloidiasis. Here, we would like to discuss the prevention of this fatal complication in leprosy patients on long-term steroid therapy.

Although *Strongyloides* stercoralis generally causes chronic and clinically asymptomatic infection, in the immunocompromised, the parasite number can increase substantially, leading to hyperinfection, dissemination and death if unrecognized. Hyperinfection may develop as early as four days after the onset of corticosteroid therapy and as late as several years, up to 20 years.[2] Early detection of this infection may alter the fatal course of infection. Leprosy patients living in strongyloidiasis endemic areas may develop a life threatening infection when their leprosy reactions are treated with steroids, without pre-treatment of *Strongyloides* stercoralis infection.[3]

There is no single ideal screening or diagnostic test for detecting *Strongyloides* stercoralis infection. Stool microscopy to

identify *Strongyloides* stercoralis larvae or ova has variable sensitivity. A direct stool microscopy has only a sensitivity of 30%, with three specimens increasing the sensitivity to 60–70%.[3] Stool concentration increases the sensitivity of stool microscopy up to 80%.[3] Other tests, such as enzyme-linked immunosorbent assay, real-time polymerase chain reaction, luciferase immunoprecipitation systems assays and culture techniques such as Baermann method, Harada–Mori filter paper culture and the nutrient agar plate method are also available. Culture methods are expensive and time consuming with 96% sensitivity. Enzyme-linked immunosorbent serologic assays measure IgG response to *Strongyloides* crude somatic antigen extracts in serum with 80–90% sensitivity.[3] It takes 4–6 weeks to mount an immune response and this can lead to a false negative result in acute infections.The test can also remain positive after treatment for extended periods of time. In addition, there is serological cross-reactivity with some patients with active filarial infections.[4] Molecular diagnostics such as reverse transcriptase-polymerase chain reaction and a stool-based assay are highly specific tools with improved sensitivity compared to microscopy. Reverse transcriptase-polymerase chain reaction, like microscopy, only identifies active *Strongyloides* infection as positivity has been shown to be lost following definitive treatment.[4] Luciferase immunoprecipitation systems assay using two *Strongyloides*-specific recombinant antigens is superior to other types of immunoassays. The advantage of luciferase immunoprecipitation systems over the standard assays is reversion to seronegative state following treatment.[4] Eosinophilia is common in strongyloidiasis ranging from 25–35% in acute cases to 6–8% in chronic cases.[5] However, patients on corticosteroids may not have eosinophilia because their immune response is blunted. Diagnosis of hyperinfection syndrome and disseminated *Strongyloides* infection is not difficult because of the large numbers of larvae often seen in the stool or other body fluids including cerebrospinal fluid, pleural fluid and bronchoalveolar lavage fluid.[4]

Among the available tests, serologic tests are both the most reliable and the most sensitive for screening the population in Strongyloides-endemic areas. However, given the cost of laboratory investigations for *Strongyloides* stercoralis identification, it is probably more cost-effective to empirically treat all patients being exposed to long-term steroids or immunosuppressive agents from high endemic countries.

Worldwide, there are different approaches to deal with this infection in leprosy. Indian leprosy manuals consider *Strongyloides* stercoralis infection to be a relative contraindication to steroid therapy. In Cambodia, the National Leprosy Program recommends the administration of empiric albendazole therapy before the initiation of corticosteroids.[3] In Brazil, there is no agreement on how to proceed with leprosy patients who have this infection, but in some cases, before the start of immunosuppressive therapy, treatment with anthelmintics is recommended to avoid hyperinfection. Albendazole, thiabendazole, mebendazole and ivermectin are the effective drugs for *Strongyloides* stercoralis infection. Albendazole has a cure rate of 95% when given in a dose of 400 mg orally twice daily for 5 days.[3] There is little data on how to use albendazole for hyperinfection. Ivermectin is the drug of choice for the treatment of strongyloidiasis. The recommended dose is 0.2 mg/kg/day taken as a single dose with 94% cure rate.[6] A regimen of two single doses of 0.2 mg/kg ivermectin, given 2 weeks apart, is also considered more clinically suitable for the treatment of chronic strongyloidiasis. In hyperinfection, daily ivermectin is administered for a minimum of 2 weeks and often until there has been evidence of 2 full weeks of negative stool examination.[6]

Recently, Oktaria *et al*. suggested that intestinal helminth infections may have a role in the progression to a more severe type of leprosy as well as in the occurrence of type 2 lepra reaction.[7] This means all leprosy patients should be screened and treated for intestinal parasitic infection.

To conclude, we suggest that all leprosy patients (particularly who have MB leprosy and severe recurrent lepra reactions) should be screened frequently or empirically treated for intestinal parasitic infection. Patients who are exposed to prolonged steroids should be carefully screened by stool microscopy or serological tests or prophylactically treated with ivermectin before corticosteroid therapy to prevent the severe forms of *Strongyloides* stercoralis infection.

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