Commentary

Pneumocystis jirovecii Pneumonia in Africa: Impact and Implications of Highly Sensitive Diagnostic Technologies

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Pneumocystis jirovecii pneumonia (PcP) is an important subject when dealing with the respiratory infections' microbiology. This acquired immunodeficiency syndrome (AIDS)-defining opportunistic infection has also been diagnosed in human immunodeficiency virus (HIV)-negative patients with moderate degrees of immunodeficiency and in immunocompetent persons.[1,2]

During the first decades of the AIDS epidemic, PcP was rarely reported in sub-Saharan Africa where the majority of persons with HIV resided.[2] More recent clinical studies, performed in this region, using sensitive methods to detect *P. jirovecii* have reported high rates of PcP cases in adults and children, with mortality rates of about 50%.[3-5]

It is believed that the early reports underestimated the actual prevalence rates. This could have occurred in part because the patients who developed AIDS would not survive long enough to achieve such a degree of immunodeficiency that lead to the development of opportunistic infections, such as PcP; and possibly also due to the lack of PcP diagnostic resources and expertise.[2]

Several methods exist for the diagnosis of PcP, including cytochemical staining, immunofluorescent staining with monoclonal antibodies, and polymerase chain reaction (PCR). Lower respiratory tract (LRT) specimens (bronchoalveolar lavage and induced sputum) used for diagnostic purpose are obtained by invasive techniques, making it not easy to perform in patients with respiratory failure or with AIDS. It is also difficult to implement laboratory diagnostic techniques and methods to obtain adequate sampling in poor-income countries because both require specialized personnel and expensive equipment.

The article "Molecular detection of *Pneumocystis jirovecii* in patients with respiratory tract infections" by Dr. Oyebode Alli[6] reports on a study performed in south western Nigeria to determine the prevalence of *P. jirovecii* in sputum samples from patients suspected of having respiratory tract infections (RTI) - patients with COPD, immunosuppression and LRT infections -, using PCR a highly sensitive technology. The authors observed that *P. jirovecii* was prevalent in all the groups of patients studied, concluding that *Pneumocystis* should be included in the diagnosis of respiratory tract infections in Nigeria. These authors also support the idea that PCR can be easily applied and should be implemented in African countries inspite of cost, because of its advantages over microscopy methods.[6]

In fact, upper respiratory tract specimens (nasopharyngeal aspirates and expectorated sputum), although less sensitive than the LRT ones, are easier to obtain, and may be utilized for PcP diagnostic purpose when combined with PCR.[7]

Even though the increased sensitivity of diagnosis carries a higher risk of false positive clinical results, it also

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increases the chances of early detection of true positives in the case of people with incipient clinical manifestations, which may be of importance in sub-Saharan Africa that has a high incidence of HIV infection.

While avoiding arguments about whether or not it is feasible to implement these technologies in poor countries, it is important to convey the idea that what is most important is to define strategies in sub-Saharan countries for the implementation of definitive diagnosis of PcP in hospitals, at least those that have wards for HIV-positive. This policy can lead to accurate estimates of the true incidence of PcP; it also can avoid PcP empirical treatment based on clinical and chest radiographs findings, with the subsequent misuse of sulfa drugs, which can lead to the emergence or spread of resistance specially to TMP-SMX, the mainstay of PcP treatment and prophylaxis regimens.

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