Pneumocystis Jirovecii Pneumonia and Colonization in Immunocompromised Patients

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Introduction. *Pneumocystis carinii* (*jirovecii*) pneumonia (PCP) is a life-threatening infection, an important cause of morbidity and death among persons with human immunodeficiency virus (HIV) infection. Asymptomatic carriage may play a role in transmission and may even supply a reservoir for future infections.

Aim, Materials and Methods. This prospective study aims to assess the ability of PCR method to discriminate PCP from *P. jirovecii* colonization (PCC), and to characterize their prevalence, clinical presentation in HIV- infected patients in Latvian Center of Infectology inpatient department. All hospitalized for various reasons adult HIV patients were investigated between January 2015 and January 2017. Oropharyngeal wash samples (OWS) were obtained from each patient on the first day of hospitalization.

Results. In total, 578 patients were included in the study. 65/578 (11.2 %) OWS were positive by qualitative PCR. Final diagnosis were given based on clinical, laboratory and radiological evidence. All 65 patients had not received PCP prophylaxis within the 3 months before admission. For the 30/65 (46 %) patients the final diagnosis of the epizode was PCP. For other 35/65 (54%) the final diagnosis was other miscellaneous, and positive PCR result interpreted as colonization. Median age in both group was 40 years (range 31–53, in PCC group; 21–53, in PCP group). In both groups the majority were men (24/35; 23/30), more likely to have intravenous drugs use as their risk factor for HIV infection (25/35; 15/30).

In PCP group, in comparision with PCC group, the majority had advanced HIV disease with a median CD4 cell count of 49 c/mcl (range, 1–266; IQR: 7–70); respectively, in PCC group – 147 c/mkl (range 2–696; IQR: 26– 173). In 7/35 patients with PCC and in 1/30 with PCP, the CD4 cell count was ≥ 200 c/mcl. In both groups, a median HIV load was of 3.1 E6 copies/mkl (range 3.1 E7–0). Hospital admission with PCR positive result represented the initial HIV diagnosis for 11/30 patients with PCP, and for 3/35 with PCC. In 26/30 cases a hepatitis C coinfection was detected in PCC group, and in 15/35 cases in PCP group. No patient received HAART in PCP group, and 1/35 patient received in PCC group. Bacterial copathogens were identified in bronchoalveolar lavage (BAL) fluid and sputum specimens in 6/35 cases in PCC group and in 19/30 cases with PCP. 33 % of patients with PCP were hospitalized in the spring, and 34 % with PCC in the winter. All patients in PCP group had the first epizode of OWS which was positive by PCR, but 6/35 patients with PCC had earlier OWS positive PCR result in last year.

Microscopic demonstration of *P. jirovecii* Ag with imunofluorescence method was positive only in 4/30 PCP patients respiratory samples (2-BAL, 2-sputum). In PCP group, common symptoms include the subtle onset of progresive dyspnoea, non-productive cough, low-grae fever. 7/30 patients were admitted to the intensive care unit. Primary therapy of PCP was trimethoprim-sulfamethoxazole in all cases; 15/30 patients received adjuvant corticosteroids. 9/30 patients are deceased; deaths were due to progressive respiratory failure. In PCC group, 3/35 patients deceased due to other reasons.

Conclusions. Mild rate of colonization among HIV-infected hospitalized patients (11.2 %) was confirmed. *P. jirovecii* DNA was detectable in OWS from adult HIV-positive patients, with CD4 < 200 c/mcl, also in the case with febrile pneumonia absence. PCR assay developed here proved to be sensitive for diagnosis of pneumocystosis, especially in low-burden infections cases. OWS with DNA detection could also be proposed as a non-invasive method for detection.