

## Evaluation of diagnostic methods and epidemiology of *Pneumocystis jirovecii* pneumonia: a five-years retrospective study

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### BACKGROUND

*Pneumocystis jirovecii* (PJ) is an opportunistic fungal pathogen that causes disease of *Pneumocystis* pneumonia (PCP) in immunocompromised patients. The traditional diagnosis of PCP is done through the clinical symptoms, radiographic findings, and visualization of fungi on staining of respiratory samples. PCR (qPCR) has shown high sensitivity, but limited specificity for distinguishing PCP from colonization.

### MATERIALS AND METHODS

Retrospective study including patients with:



**POSITIVE** qPCR result for *P.jirovecii* between 2018 and 2022

The molecular study was carried out using (*Pneumocystis* ELITE MGB<sup>®</sup> and VIASURE<sup>®</sup> *Pneumocystis jirovecii* kit).

### RESULTS

79 patients

HIV		5/79 (6,3%)
Non - HIV	Solid tumor	18/79 (22,7%)
	Hematologic cancer	26/79 (32,9%)
	Rheumatoid arthritis	7/79 (8,8%)
	Others	23/79 (29,1%)

Table 1: Classification of positive PJ PCRs according to the patient's pathology

27.1% (19/70) of the positive PCRs for PJ were co-detected with a respiratory virus. Table 2

Respiratory virus	Co-detection with PJ
Rhinovirus	9/19 (47%)
Respiratory Syncytial Virus	1/19 (5,2%)
Betacoronavirus- 1	3/19 (15,7%)
Parainfluenza	2/19 (10,5%)
Influenza virus (A+B)	3/19 (15,7%)
Adenovirus	1/19 (5,2%)

Table 2: Co-detections with respiratory virus

PCR Cytomegalovirus	14/60 (23,3%)*
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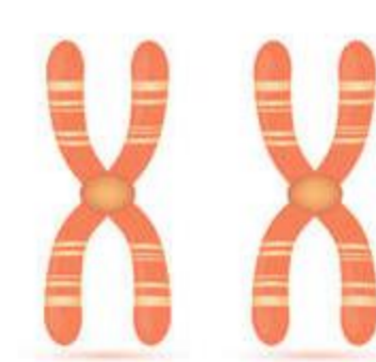
\*>680 copies/ml

Sixty-three patients received targeted therapy regardless of *P.jirovecii* copy number results. Instead, three patients with <1250 copies/ml received chemoprophylaxis treatment. Table 3

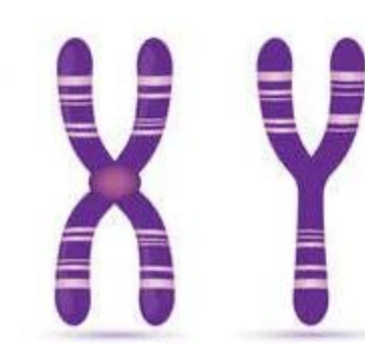
Type of treatment	%
Targeted therapy	79,7 (63/79)
Chemoprophylaxis treatment	3,7 (3/79)

Table 3: Percentages of type of PJ treatment

Forty-eight patients (60.7%) were between 50 and 75 years, with a median age of 68 (IQR 31–86). Figure 1: Distribution of positive PJ-PCR by age



48,1%

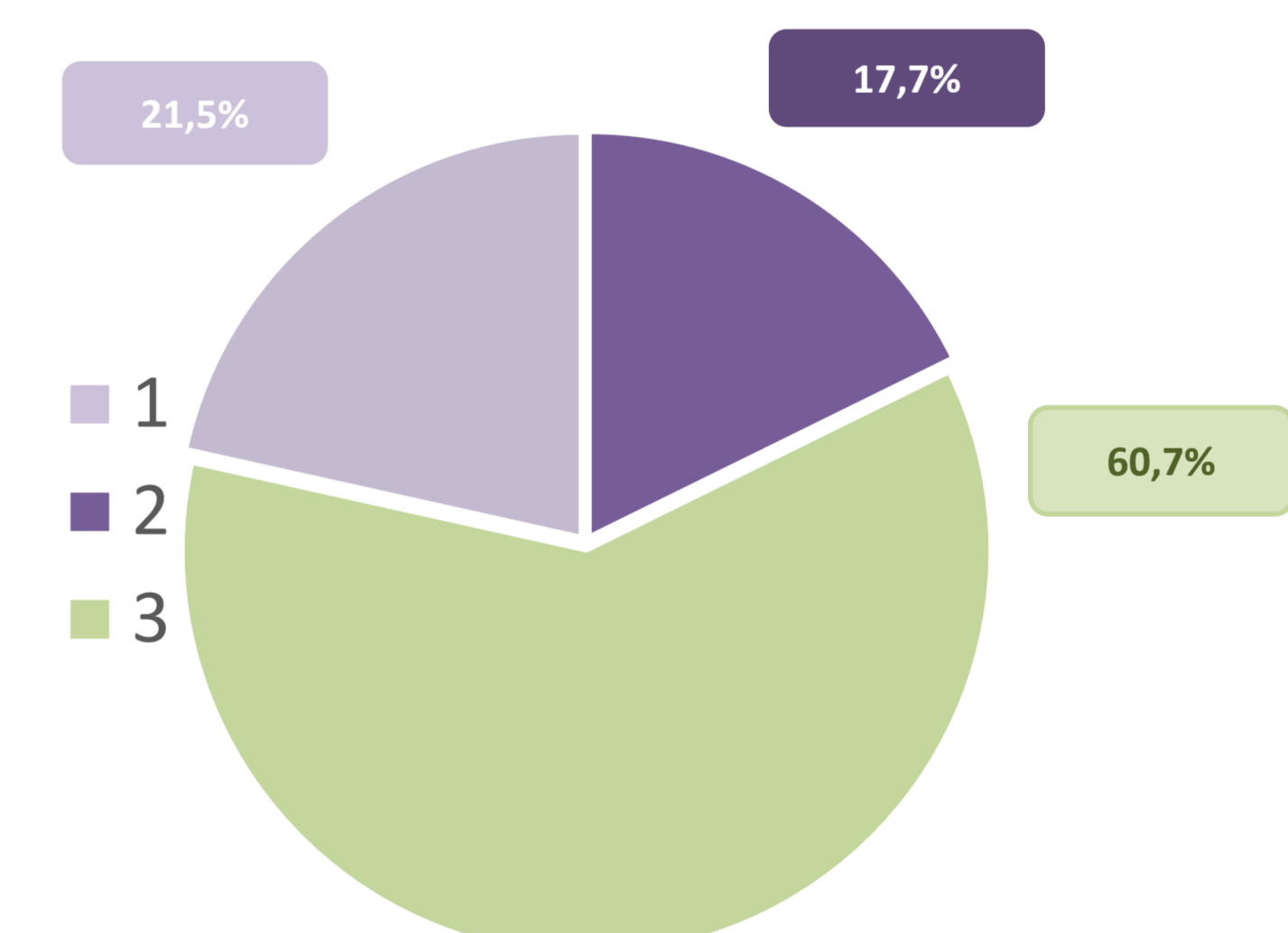


51,8%

76-100 years: 17/79

26-50 years: 14/79

51-75 years: 48/79



Only three patients (3.7%) had a **positive staining** result of the respiratory sample, this does not correlate with the number of copies/ml of *P.jirovecii*. Table 4

Histopathology	%
Negative	83,5 (66/79)*
Positive	3,7 (3/79)
Not performed	12,6 (10/79)

Table 4: Percentages of staining PJ results of respiratory samples

### CONCLUSIONS:

- The staining methods have been shown poor sensitivity for detection of PCP.
- qPCR is a well-established method for the *P.jirovecii* detection and quantification that also does not require experienced personal.
- Prevalence of the disease among HIV-infected patients has decreased.
- It is necessary to establish a cut-off point to assess colonization and PCP, as well as to standardize quantitative molecular methods.

