



Multicentre prospective evaluation of histological and molecular criterion for diagnosis of prosthetic-joint infection

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Auteur	Bémer, Pascale [1], Tande, Didier [2], Plouzeau, Chloé [3], Léger, Julie [4], Valentin, Anne Sophie [5], Gougeon, A. [6], Vincent, P. [7], Corvec, Stéphane [8], Juvin, Marie Emmanuelle [9], Héry-Arnaud, Genevieve [10], Lemarié, Carole [11], Kempf, Marie [12], Bret, Laurent [13], Quentin, Roland [14], de Pinieux, Gonzague [15], Bernard, Louis [16], Burucoa, Christophe [17]
Organisme	Centre de Référence des Infections Ostéo-articulaires du Grand Ouest (CRIOGO) study group [18]
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Objectives:

This multicenter prospective study was performed to assess the contribution of broad range PCR diagnosis in prosthetic-joint infection (PJI).

Methods:

Adult patients treated for PJI at 7 centers were included between December 2010 and March 2012. Six per-operative samples were obtained for each patient, 5 for conventional cultures and 16S rRNA gene real-time PCR followed by sequencing, and 1 for histopathological classification according to Morawietz. Cultures and PCR were performed in a highly standardized manner, with 3 quality controls of PCR analyses. An infection was considered as proved (3 criteria: per-operative, bacteriological and histological), probable (clinical or bacteriological criterium), or excluded (no criterium). Molecular criterium for predicting PJI was determined using the bacteriological one as reference (≥ 1 positive sample for virulent organism, and ≥ 3 positive samples for coagulase-negative staphylococci (CoNS) and *P. acnes*).

Results:

299 patients were included, 264 with suspicion of sepsis (S) and 35 as controls (C). The 264 S presented with acute (19%), or chronic suspicion of PJI (81%). Infection was proved or probable in 212/264 S (80%), with the bacteriological criterium in 189/212 S (89%). Out of these, 156 (83%) had monomicrobial and 33 (17%) polymicrobial infections. The isolated pathogens were *S. aureus* (40%), CoNS (25%), streptococci (14%), Gram-Negative rods (10%), and anaerobes 8%. Histology results were not available for 55 patients, leaving 244 patients available for analysis. Histological findings of infection (Morawietz types II or III) were present in 128/169 (76%) proved or probable infections, in 3 patients without any other criterium, and were absent in excluded infections (n=42) and controls (n=29). PCR results were not analysable for 32 patients (S=28, C=4), leaving 267 patients (S=236, C=31) available for analysis. Molecular criterium of infection was present in 63/68 (93%) proved infections, 83/124 (67%) probable infections, 3/42 excluded infections, 0/2 histological criterium alone and 2/31 controls. Molecular criterium of infection was absent in 34/189 (18%) culture-positive S, and present in 8/23 culture-negative S (8 patients treated with antibiotics).

Conclusions:

According to this multicenter prospective study, 16S rRNA gene real-time PCR is less susceptible than culture for diagnosis of PJI. Molecular analysis could be recommended in culture-negative patients who were receiving antibiotics.

Résumé en anglais

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