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## **Chronic *Pseudomonas aeruginosa* Infection in Chronic Obstructive Pulmonary Disease.**

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**BACKGROUND:** *Pseudomonas aeruginosa* infections are increasingly associated with acute exacerbations in chronic obstructive pulmonary disease (COPD). We aimed to determine whether an underlying chronic infection might be behind this process and to determine the epidemiological characteristics of the isolates involved, to implement useful protocols for preventing and treating these infections.

**METHODS:** *P. aeruginosa* isolates obtained from respiratory samples of 13 patients with COPD and from blood samples of 10 patients in intensive care units were investigated. In 8 patients with COPD, isolates were obtained during sequential exacerbation episodes. Five patients presented a single infection episode. Production of virulence determinants and genetic relationships were analyzed in all isolates.

**RESULTS:** Patients with COPD were usually infected with 1 *P. aeruginosa* clone that remained in the lung for years, without evidence of interpatient transmission. During chronic infection, each clone diversified, which led to the coexistence of isolates with different morphotypes and antibiotic susceptibility. Overall, *P. aeruginosa* evolved toward an increased mutation rate, increased antibiotic resistance, and reduced production of proteases. Isolates from samples of infected lungs tend to be less cytotoxic and motile and to produce more biofilm, compared with isolates from blood samples.

**CONCLUSION:** These results provide the first evidence supporting the hypothesis that *P. aeruginosa* causes chronic infections in COPD, with patterns of infection and evolution that resemble those observed in cystic fibrosis. Experience gained from treating cystic fibrosis might be useful for implementing new procedures for the prevention, diagnosis, and treatment of infection due to *P. aeruginosa* in COPD.

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