

XIX CONGRESO DE LA SOCIEDAD ARGENTINA DE MICROBIOLOGÍA GENERAL

22 al 25 de octubre del 2024

Centro cultural y Pabellón Argentina de la Universidad Nacional de Córdoba, Córdoba, ARGENTINA.



Foto: Se hace camino al andar. Celeste Dea. 1er puesto. Concurso fotográfico SAMIGE 20 años.

INTERACTION AMONG *Staphylococcus aureus*, *Moraxella catarrhalis* AND *Pseudomonas aeruginosa* IN POLYMICROBIAL INFECTIONS IN PATIENTS DIAGNOSED WITH PRIMARY CILIARY DYSKINESIA (PCD)

Tripoloni, Mateo¹-Lorena Ibarra²-Juan Ballinoti²-Tribelli Paula M.^{1,3}

1) Departamento de Química Biológica, Facultad de Ciencias Exactas y Naturales, Universidad de Buenos Aires, Buenos Aires, Argentina

2) Hospital General de Niños Dr. Ricardo Gutierrez, Ciudad Autónoma de Buenos Aires, Argentina

3) Iquibicen-CONICET, Buenos Aires, Argentina

Contacto: mateotripo@hotmail.com

Interactions between microorganisms during infectious processes influence virulence, antibiotic resistance, clinical progression, and final outcome. *Pseudomonas aeruginosa* (PA) and *Staphylococcus aureus* (SA) are opportunistic human pathogens that can co-isolate in endobronchial infections in patients with cystic fibrosis (CF) and primary ciliary dyskinesia (PCD). Particularly in the case of PCD, the occurrence of *Moraxella catarrhalis* (MC) is also frequent. Knowledge of infections in PCD derives mainly from CF analysis, although the etiology of the disease and the characteristics of the microenvironment are different. In this work, 14 (SA:10; PA:2; MC:2) isolates from pediatric patients diagnosed with PCD were characterized for virulence, considering if they came from mono- or polymicrobial infections. Of the 10 SA isolates, only one (obtained from coinfection with PA) did not show hemolytic activity, while all showed DNase activity. Regarding the two PA isolates, both showed protease and lipase activity. In particular, for isolate PA-B (from coinfection with SA) a precipitate was also observed indicating phospholipase C activity. Finally, MC isolates did not show protease, lipase, or hemolytic activity. Only DNase activity was present in them, with lower values than those obtained in SA isolates. Plate competition assays were also performed between SA-PA and MC-SA, including CF isolates from SA and PA and reference strains (PAO1 and USA300). There was significantly higher growth inhibition generated by PA-A (from co-infection with SA) on SA-D (mono-infected) lawn relative to SA-B lawn (from co-infection with MC). There were no significant differences between growth inhibition generated by CF and PCD isolates. Regarding SA-MC competition, growth inhibition generated by SA isolates did not differ between MC-A (from co-infection with SA) and MC-C (mono-infection) lawns. Finally, given the difference observed in the frequency of MC isolation in PCD compared to CF, the resistance of MC to high salt concentrations was analyzed. While PAO1 developed colonies on agar containing NaCl at concentrations of up to 56.25 g/l, presenting 3x10⁹ CFU/ml, MC showed a lower capacity to develop in these conditions, obtaining colony growth on agar with 18.75 g/l NaCl concentration presenting 10⁷ CFU/ml. In conclusion, the isolates showed

variability in the virulence factors analyzed, while in the case of competence SA-PA it was possible to observe a pattern that would depend on the condition from which each strain was isolated, monoinfections or coinfections. Interestingly, this observation applied to SA from coinfection with MC. Additionally, the tolerance of MC to salt allows us to hypothesize that this factor is key to the lower frequency of isolation of this bacterium in CF due to the imbalance in sodium concentration that would not be present in PCD, showing the importance of studying polymicrobial infections in the context of each disease.

Palabras clave: INTERACTIONS-PRIMARY CILIARY DYSKINESIA-VIRULENCE-OSMOTIC