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Title:

Changing epidemiology of the respiratory bacteriology of patients with cystic fibrosis-data from the European cystic fibrosis society patient registry.

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What was your research question?

Has the prevalence of recognised cystic fibrosis (CF) pathogens (such as *Pseudomonas aeruginosa*, *Burkholderia cepacia complex* species and *Staphylococcus aureus*, *non-tuberculous mycobacteria* and *Stenotrophomonas maltophilia*) changed between 2011 to 2016 across Europe?
Is the frequency of CF pathogens different among three European country groups, according to their socio-economic status?

Why is this important?

Epidemiological data on the change of frequency of CF pathogens among European countries will be useful to evaluate the impact of newer therapies, including CF transmembrane conductance regulator (CFTR) correctors and potentiators, the effectiveness of the new infection prevention and control guidelines, and eradication strategies within European CF centers.

What did you do?

We analyzed data of 41,101 patients reported to the European Cystic Fibrosis Society Patient Registry (ECFSPR) from 2011 to 2016 to assess the frequency of detection of CF pathogens and their trends during these years. The ECFSPR collects data on infection from the following CF pathogens: *Pseudomonas aeruginosa*, *Burkholderia cepacia complex* species and

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Staphylococcus aureus, as well as on the occurrence of *non-tuberculous mycobacteria* and *Stenotrophomonas maltophilia*. The same analyses were performed for different country groups, according to their socio-economic status.

What did you find?

The epidemiology of CF pathogens in Europe has changed over the time period studied. The pathogens of the highest prevalence were *Pseudomonas aeruginosa* and *Staphylococcus aureus.* However, overall the prevalence of *Pseudomonas aeruginosa* decreased by 0.73% annualy, while it increased by 0.60% annually for *Staphylococcus* aureus between 2011-2016. The prevalence of both *non-tuberculous mycobacteria* and *Stenotrophomonas maltophilia* increased over the study period. Furthermore, epidemiologic data differed significantly among countries with different socio-economic status. In particular, for PsA, BCC and SA the prevalence was significantly higher in the lower-income group and lower- in the higher-income group. The positive point of our data is a significant improving trend in PsA prevalence in all country groups.

What does this mean and reasons for caution?

While the epidemiology of CF pathogens in Europe has changed in recent years, the prevalence and time trends of the different pathogens showed significant differences among countries with different socio-economic status.

Study limitations Include that disease registries may have missing data or data entry errors which could affect the study findings. In addition, it is recognised that CF centers of various socio-economic status will have differences in the way data is collected which could affect the quality of data reported. Furthermore, it is unknown if all microbiological examinations were performed to routinely assess all CF associated pathogens according to guidelines.

What's next?

Findings from this study have implications for clinical care and implementation of infection control recommendations across Europe. Future studies should continue to evaluate the incidence and prevalence of specific species over a longer time across Europe, as well as the frequency of and risk factors for patient-to-patient transmission.

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