Cystic Fibrosis Research News

Title:

Respiratory rate in infants with cystic fibrosis throughout the first year of life and association with lung clearance index measured shortly after birth

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What was your research question?

The aim of the study was to investigate if respiratory rate in infants with cystic fibrosis (CF) differs compared to healthy infants and if it is it associated with other lung function measurements.

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Why is this important?

Impaired lung function in CF is already apparent in infants. However, options to monitor early lung disease are limited as most of today's diagnostic tools require radiation or sedation. Respiratory rate is a key vital sign, easy to assess during sleep and elevated where there is acute respiratory diseases. However, breathing frequencies in infants with CF are not known. A higher respiratory rate implies more work is needed to breathe. Thus, a high respiratory rate in infants with CF could indicate early lung impairment and serve as a diagnostic tool in disease monitoring.

What did you do?

We included 43 infants with CF and 110 healthy infants in the study. Throughout the first year of life, parents measured their children's respiratory rate weekly during quiet, regular sleep. This can easily be done by putting a hand on the infants' chest. Weekly respiratory symptoms were also documented. In total 5656 respiratory rate measurements were analysed. Furthermore, lung function was measured in all infants within the first weeks of life.

What did you find?

Respiratory rate declined from the age the age of 6 weeks to the age of 50 weeks in infants with CF and healthy infants. It was consistently higher in infants with CF compared to healthy infants throughout the first year of life. Furthermore, infants with a reduced lung function in the first weeks of life had higher respiratory rate measurements throughout the study period. In addition, in respiratory rate measurements varied greatly between the individuals. Furthermore, while most infants had similar respiratory rate measurements from week to week, some infants had a variable breathing frequency.

What does this mean and reasons for caution?

Elevated respiratory rate in infants with CF might be an early sign of reduced lung function and reflect early lung damage. As respiratory rate varies both between individuals and also in some infants over time, larger studies are needed before respiratory rate can be used as a regular measurement in the clinic. However, as measuring respiratory rate is not expensive and easily possible in non-cooperative children, we believe it has a large potential for widespread use to help to monitor CF disease.

What's next?

While our results seem promising, further studies with more participants and more frequent measurements of respiratory rate (e.g. twice a day) to investigate the individual variability of

respiratory rate will show if respiratory rate measurements can be used in daily clinical practice.

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