Cystic Fibrosis: Literature Review

Angel Roby

Lakeview College of Nursing

Dr. Ariel Wright

October 21, 2022

Cystic Fibrosis: Literature Review

Cystic fibrosis affects more than 30,000 children and adults in the US and 70,000 people worldwide. Cystic fibrosis is one of the leading causes of death among various lung diseases (Endres & Konstan, 2022). Early detection and optimal treatment are the goals of preventing a decline in the patient's health. A literature review on cystic fibrosis may enhance the body of knowledge on the subject in question (Houser, 2020). This literature review will go over the general overview of cystic fibrosis, its diagnosis, and treatment of the disease.

Quantitative multivolume proton-magnetic resonance imaging in patients with cystic fibrosis lung disease: Comparison with clinical indicators

Pennati et al. (2019) dive into magnetic resonance imaging (MRI) and its relationship with cystic fibrosis (CF). MRI has the advantage over global measures of functional impairment that it can identify local structural and functional alterations in CF lung disease (Pennati et al., 2019). As a non-ionizing imaging technique, MRI may be lovely in CF care for longitudinal evaluation, providing a new imaging biomarker to detect early ventilatory abnormalities (Pennati et al., 2019). Other diagnostic tests are mentioned throughout this article, identifying different CF variabilities.

Key Points

Pennati et al. (2019) used a cross-sectional study. Patients with CF were participants in their annual review in stable clinical condition. For their annual review, a sweat chloride test confined the diagnosis of CF. In total, 28 consecutively selected patients (mean age 18 years,

range 10–27 years, 14 males) enrolled in the study. All patients underwent a chest MRI, spirometry, and multiple breath washout test (MBW). This study was approved by the local ethics committee and conducted in compliance with the guidelines of the institutional review board.

The lungs were divided into six lobar regions (five lobes plus lingula) and assessed for 1) bronchiectasis/bronchial wall thickening (bronchial wall abnormalities); 2) mucus plugging; 3) abscesses/sacculations; 4) consolidations; and 5) remarkable findings. The findings assessed each lobe as 0 (no lobe involvement), 1 (less than half a lobe involved), and 2 (more than half a lobe involved) (Pennati et al., 2019). Pennati et al. (2019) found a strong correlation between quantitative multi-volume MRI, spirometry, and MBW and a clear structure-function relationship in CF lung disease. A p-value <0.05 was considered statistically significant.

Pennati et al. (2019) emphasize that these results support the further investigation of multi-volume MRI to detect and regionally monitor disease progression and quantify individual response to treatment. MRIs have proven sensitivity to structural changes at various stages of CF lung disease. Because the present study is cross-sectional, we can only speculate that MRI ventilation measures will worsen with advancing structural alterations and that ventilation defects can anticipate morphological changes (Pennati et al., 2019). Future longitudinal studies using multi-volume MRI may elucidate local structure-function relationships in patients followed over several years (Pennati et al., 2019). The authors also explain the study's limitations and concerns regarding the lack of patients and the fact that it is cross-sectional.

Assumptions

Pennati et al. (2019) assumed that breath-hold multivolume 1H-MRI would provide quantitative biomarkers in CF lung disease capable of detecting functional impairment. In

particular, they aimed to verify the correlation between multivolume H-MRI biomarkers and standard clinical parameters and to investigate the relationship between functional impairment and structural damage quantified by a specific CF-scoring system (Pennati et al., 2019). The authors also assume that the MRI is the only diagnostic tool to visualize early deficits in CF patients. After the study came out with the results, results showed that the other diagnostic tools mentioned in the article also helped visualize lung deficits (Pennati et al., 2019).

Deficit/Conclusion

The reader accepts the authors' line of reasoning because, in the article, the authors' study shows that an MRI is essential in finding a deteriorating factor in CF patients. Pennati et al. (2019) state that imaging function and structure are essential in CF because functional lung changes are dissociated from structural changes; imaging may reveal the structure-function relationship at the regional and whole lung. If nursing fails to accept this line of reasoning, preventing further complications of CF will be harder to catch. As mentioned earlier, the reasoning behind the imaging is to ensure that if the patients are deteriorating, this is a way to know to catch and fix it. The outcome would be catastrophic, leading to more deaths among CF patients.

Second article title here

Here add in a summary of the article. Follow the MEAL paragraph formatting and use Grammarly.com. Be sure to cover all aspects within the rubric. Be sure to use double space and to tab over for your first line of a new paragraph.

Key Points

Paragraph goes here discussing the key points of the article. Follow the MEAL paragraph formatting and use Grammarly.com.

Assumptions

Paragraph goes here discussing the assumptions of the article. Follow the MEAL paragraph formatting and use Grammarly.com.

Deficit/Conclusion

Paragraph goes here discussing the conclusion of the article. Follow the MEAL paragraph formatting and use Grammarly.com. Do you accept the authors' line of reasoning? What are the implications for this article? If nursing fails to accept this line of reasoning, what would the implications be?

Third article title here

Here add in a summary of the article. Follow the MEAL paragraph formatting and use Grammarly.com. Be sure to cover all aspects within the rubric. Be sure to use double space and to tab over for your first line of a new paragraph.

Key Points

Paragraph goes here discussing the key points of the article. Follow the MEAL paragraph formatting and use Grammarly.com.

Assumptions

Paragraph goes here discussing the assumptions of the article. Follow the MEAL paragraph formatting and use Grammarly.com.

Deficit/Conclusion

Paragraph goes here discussing the conclusion of the article. Follow the MEAL paragraph formatting and use Grammarly.com. Do you accept the authors' line of reasoning? What are the implications for this article? If nursing fails to accept this line of reasoning, what would the implications be?

Conclusion

Write a conclusion here in your overall paper. Follow the MEAL paragraph formatting and use Grammarly.com. Provide a summary/conclusion of the analysis of all three articles. Discuss how the information can improve:

- Patient outcomes
- Nursing practice
- Evidence-based practice/Quality Improvement efforts
- Healthcare as a whole

References

Endres, T. M., & Konstan, M. W. (2022). What is cystic fibrosis?. *JAMA*, *327*(2), 191. https://doi.org/10.1001/jama.2021.23280

Pennati, F., Salito, C., Borzani, I., Cervellin, G., Gambazza, S., Guarise, R., Russo, M. C., Colombo, C., & Aliverti, A. (2019). Quantitative multivolume proton-magnetic resonance imaging in patients with cystic fibrosis lung disease: Comparison with clinical indicators. *The European Respiratory Journal*, *53*(5), 1702020. https://doi.org/10.1183/13993003.02020-2017