Nursing Case Study – Complex Patient Situation

Introduction

Mich is a 17-year-old boy who was brought to the emergency department with complaint of breathlessness and chest pain. His parents informed the medical team about his asthma history and the prescribed inhaler and medicine. The medical team conducted a physical examination and spirometry for Mich. He had been given a confirmed diagnosis of Chronic Obstructive Pulmonary Disease (COPD). This assessment involves the exploration of Mich's case study. The pathophysiology, nursing assessment, and nursing interventions for COPD are explicated. Within Mich's COPD care context, the specifics of patient education to be offered by the nurse are delineated.

Pathophysiology

Childhood asthma increases the risk for the development of COPD. A 10-to-30-fold risk of COPD is linked with a history of asthma. Asthma and COPD share environmental and genetic risk factors. Lung function deficit is accompanied by childhood asthma in adulthood, which may turn into early or severe COPD (McGeachie, 2017). Patients who have persistent airflow limitation and clinical signs consistent with asthma are likely to develop COPD (Dey et al., 2022). Chronic obstructive pulmonary disease is marked by lung inflammation, leading to poor reversible airflow obstruction. Constant bronchospasm leads to increased mucous production, bringing about oxidative stress and lung function decline. Variable airflow obstruction is caused by allergen exposure with airway hyperresponsive (Dey et al., 2022; Leap et al., 2021). In line with the case study, Mich's asthma history may have contributed to his COPD diagnosis.

Nursing Assessment

The diagnosis of COPD can be assessed through the data obtained from the most vital prognostic tool, spirometry. The forced expiratory volume in 1 s (FEV1) is the main mortality predictor (Wang et al., 2022). The distinct symptom of airflow obstruction can be confirmed by spirometry to clinically diagnose COPD. The progression of a range of obstructive lung diseases is diagnosed and monitored by spirometry (Aranburu-Imatz et al., 2022). The COPD

Assessment Test (CAT) is a validated scoring system to report patient symptoms. Physical assessment such as respiratory depth and rate along with lung auscultation can be led. Some novel assessment methods for COPD include chest imaging-based metrics (Wang et al., 2022). Since Mich has asthma history and symptoms such as breathlessness and chest pain, assessing for COPD is vital. Specialist respiratory nurses can assess Mich's lung health.

Nursing Interventions

Nurse-led interventions improve physical, mental, and clinical symptoms among COPD patients. Nurses accompany patients in the management of COPD in all phases. They correctly perform inhalation therapy, oxygen therapy, and physical exercise for the patients. Optimal pharmacological and non-pharmacological COPD management is ensured by specialist nurses (Aranburu-Imatz et al., 2022). According to Chen et al. (2024), nurses ensure optimal pulmonary rehabilitation for COPD patients. Each respiratory support therapy alleviates the symptoms of breathlessness to enhance the efficacy of pulmonary rehabilitation. Besides administering medicines and oxygen therapy, nurses educate the patient to facilitate behaviour change (Chen et al., 2024).

Regularly assessing COPD patient's vital signs, mainly respiratory rate and status is critical. Breathing exercises are required to lessen the breathing effort and alleviate oxygen desaturation. The work of breathing of COPD patients is improved by nursing interventions. Administering bronchodilators decreases airflow resistance during respiration and enhances patients' lung mechanics (Wang et al., 2022; Aranburu-Imatz et al., 2022; Chen et al., 2024). In line with Mich's case, essential nursing interventions are oxygen therapy, inhalation therapy, and physical therapy. Nurses will monitor Mich's vital signs periodically and ensure the apt provision of appropriate interventions. Mich's work of breathing must be improved by the respiratory nursing staff to enhance his overall lung functioning.

Patient Education

Patient education for COPD patients plays a very important role in self-management. It is a part of contemporary patient-oriented care. Personalised education is to be offered to patients and their families to improve their lung health outcomes (Stoilkova-Hartmann et al., 2018). In view of Mich's condition, nurses must offer him and his parents adequate education on asthma and COPD management. He should be encouraged to adhere to his

medication regime and perform optimal breathing exercises. Lifestyle-related changes can be adequately ensured by educating Mich and his family. Aranburu-Imatz et al. (2022) put forth that nurse-led education improves post-discharge outcomes in COPD patients.

Conclusion

To conclude, Mich has an asthma history and a COPD diagnosis, admitted to the emergency department. Chronic inflammation, persistent bronchospasm, mucous production, airflow obstruction, and hyperresponsiveness are the aspects of the pathophysiology of asthma-induced COPD in Mich's case. Spirometry and other assessment tools are used for COPD assessment. Essential nursing interventions for Mich's pulmonary rehabilitation include vital signs monitoring, oxygen therapy, inhalation therapy, and physical therapy. Nurses will adequate education to Mich and his family to ensure improved self-management post-discharge. Improvement in his lung functioning can enhance his asthma and COPD-related outcomes.

References

Aranburu-Imatz, A., López-Carrasco, J. D. L. C., Moreno-Luque, A., Jiménez-Pastor, J. M., Valverde-León, M. D. R., Rodríguez-Cortés, F. J., ... & Morales-Cané, I. (2022). Nurse-led interventions in chronic obstructive pulmonary disease patients: a systematic review and meta-analysis. *International Journal of Environmental Research and Public Health*, *19*(15), 9101. https://doi.org/10.3390/ijerph19159101

Chen, X., Xu, L., Li, S., Yang, C., Wu, X., Feng, M., ... & Zhu, J. (2024). Efficacy of respiratory support therapies during pulmonary rehabilitation exercise training in chronic obstructive pulmonary disease patients: a systematic review and network meta-analysis. *BMC Medicine*, *22*(1), 389. https://doi.org/10.1186/s12916-024-03605-7

Dey, S., Eapen, M. S., Chia, C., Gaikwad, A. V., Wark, P. A., & Sohal, S. S. (2022). Pathogenesis, clinical features of asthma COPD overlap, and therapeutic modalities. *American Journal of Physiology-Lung Cellular and Molecular Physiology*, *322*(1), L64-L83. https://doi.org/10.1152/ajplung.00121.2021

Leap, J., Arshad, O., Cheema, T., & Balaan, M. (2021). Pathophysiology of COPD. *Critical Care Nursing Quarterly*, *44*(1), 2-8. https://doi.org/10.1097/CNQ.0000000000000334

McGeachie, M. J. (2017). Childhood asthma is a risk factor for the development of chronic obstructive pulmonary disease. *Current Opinion in Allergy and Clinical Immunology*, *17*(2), 104-109. https://doi.org/10.1097/ACI.0000000000000348

Stoilkova-Hartmann, A., Franssen, F. M., Augustin, I. M., Wouters, E. F., & Barnard, K. D. (2018). COPD patient education and support–achieving patient-centredness. *Patient Education and Counseling*, *101*(11), 2031-2036. https://doi.org/10.1016/j.pec.2018.05.024

Wang, J. M., Han, M. K., & Labaki, W. W. (2022). Chronic obstructive pulmonary disease risk assessment tools: is one better than the others?. *Current Opinion in Pulmonary Medicine*, *28*(2), 99-108. https://doi.org/10.1097/MCP.0000000000000833