Prevalence of chronic obstructive pulmonary disease in lorain, ohio

Chronic obstructive pulmonary disease (COPD) is an avoidable, incapacitating, and potentially fatal disease of the respiratory system. COPD is the " third leading cause of death in the United States and fourth leading cause of death worldwide" (Schub & Avital, 2017). COPD is a disease that typically occurs as a result of tobacco smoking. It is important that practitioners diagnose COPD early in order to properly manage symptoms and slow the progression of the disease to assist in providing their patients with an improved quality of life. This paper will aim to discuss COPD, what it is, risk factors, symptoms, and COPDs incidence, and prevalence in Lorain, Ohio.

Background

COPD is defined as " persistent respiratory symptoms and airflow limitation

due to airway and/or alveolar abnormalities, usually caused by significant exposure to noxious particles or gases" (Schub & Avital, 2017). Smoking is the number one cause of acquiring COPD. A genetic disorder called alpha-1-antitrypsin deficiency (AATD) can also cause COPD. When someone affected with " AATD smokes, they increase the effect of smoking on their lungs, which results in a decrease of lung function" and ultimately COPD emerges (Russo et al., 2016). COPD is diagnosed by collecting a thorough patient history, patient symptoms, and " ruling out other forms of lung and heart disease" (Schub & Avital, 2017).

Signs and Symptoms

COPD gets worse overtime, making COPD a progressive disease with symptom severity increasing over time. Some common initial " symptoms of COPD include, dyspnea, fatigue, chronic cough increased sputum production, and weight loss" (Schub & Avital, 2017). People with COPD may often find themselves sick with flu, colds, and pneumonia (National Institutes of Health [NIH], 2017b). Many people who have mild COPD symptoms may find themselves adjusting their lifestyle (i. e. taking the elevator instead of stairs) in order to combat symptoms.

As the disease progresses, patients may find themselves requiring emergent treatment for their symptoms (NIH, 2017b). Many people with advanced COPD may find they are visiting the emergency room frequently. With " advanced COPD" patients often " present with edema cyanosis, plethora, labored breathing, barrel chest, cachexia, and pursed-lip breathing" (Schub & Avital, 2017). These patients often find themselves becoming short of breath with or without exertion.

Incidence and Prevalence of COPD

In the United States it is estimated that " 15 million people have been diagnosed with COPD and another 15 million are undiagnosed" (Schub & Avital, 2017). About 80% of all COPD cases are related to smoking tobacco products (Schub & Avital, 2017). In the state of Ohio, 628, 000 people have COPD (NIH, 2017). Incidence is the number of new cases of a disease over a given period of time, whereas, prevalence is the measure of the actual number of cases during a given time. The chart below measures the incidence and prevalence rates of COPD in the United States, the state of

Ohio, and Lorain County. Table 1 below provides the statistics of the incidence and prevalence of COPD in Ohio and the United States.

Table 1: Incidence and Prevalence of COPD at the County, State, and National Levels

Statistics	United States	Lorain County, Ohio	State of Ohio
Incidence	4, 928 per 100, 000	6, 947 per 100, 000	676 1 per 100, 000
Prevalence	5. 5-6. 3%	8. 3-9. 9%	7. 06-9. 29%

Centers for Disease Control and Prevention (2018). Chronic obstructive pulmonary disease (COPD). Retrieved fromhttps://www. cdc. gov/copd/data. html

Surveillance Methods

As mentioned earlier, there are just as many undiagnosed cases of COPD as there are diagnosed cases. Unfortunately, there is not a system in place that mandates reporting of COPD, therefore, surveys and self-reports are the main sources of surveillance methods. The Behavioral Risk Factor Surveillance System (BRFSS), the National Health and Nutrition Examination Survey (NHANES), and the National Health Interview Survey (NHIS) are the three surveillance systems in place for COPD data collection (CDC, 2011).

The BRFSS is a " random telephone survey of adults conducted through collaboration with the Centers of Disease Control and Prevention (CDC) and all 50 US states that gathers data that puts adults at risk for chronic disease" (Song, Mercer, Wakefield, Laurent, & Solet, 2016). The BRFSS is a health survey that conducts " more than 400, 000 surveys each year" (CDC, 2016). The BRFSS " provides data at state and local levels" (CDC, 2016).

The NHANES collects data through " interviews, spirometry, and physical examinations" (CDC, 2017). NHANES interviews consist of information about socioeconomic status and includes questions based upon diet and health. The NHANES is a program through the CDC that provides information on " vital and health statistics for the nation" (CDC, 2017). The NHANES survey is important in order for researchers to determine disease cause and risk factors.

The NHIS is a leading source of data on the health of the people in the United States. The NHIS is another survey that collects self-reported data (CDC, 2011). The information from the NHIS survey is collected in " household

interviews" that allow for data to track the progress we are making toward reaching our national objective goals (CDC, 2011).

Descriptive Epidemiological Analysis

According to the CDC (2018), approximately " 15 million Americans were reported to have COPD". In order to create a prevention plan for COPD, it would be important to know the type of people who need preventative help. The following statistics may assist in creating a prevention plan that caters to these groups of people. The most common people reported with COPD were current or former women tobacco smokers, who are over the age of 65, and of American Indian, Alaska Native, multi-racial, or non-Hispanic black descent (CDC, 2018).

According to the American College of Chest Physicians (2014), " in 2010, the annual medical cost for COPD was 32. 1 billion dollars". The estimated cost per person with COPD, depending on severity, is estimated to be between "$1, 681 and $10, 812 for medication, non-medication, and hospitalization" (Guarascio, Ray, Finch, & Self, 2013).   The total medication costs per patient with COPD is estimated to be between $512 and $766 depending on the severity of the disease (Guarascio, Ray, Finch, & Self, 2013).

Screening and Diagnosis

In order to screen for COPD, it is recommended that you only screen people who are experiencing symptoms. One way to screen for COPD is through spirometry testing. Spirometry testing is used before and after a bronchodilator in order to determine its ability to open the patients airway.

According to the CDC (2017), " the current standard for COPD diagnosis is spirometry". The U. S. Preventative Task Force, however, has recommended " against using spirometry to screen COPD in asymptomatic patients" (Johnson, Tan, Bourbeau, Sin, & Sadatsafavi, 2018).

Luize et al. (2014), use the Global initiative for Obstructive Lung Disease (GOLD) guideline in order to determine how many people met criteria for spirometry testing. Luize et al. (2014) used the information obtained through their study in order to compare the GOLD criteria to other diagnosing criteria of COPD through measuring the sensitivity, specificity, and positive and negative predictive values. Of people who participated in the study, " 2, 195 (41. 3%) met criteria for spirometry testing" (Luize et al., 2014). The GOLD criteria reported a " sensitivity of 54. 9%, specificity of 61%, positive predictive value of 19%, and a negative predictive value of 89%" (Luize et al., 2014). According to Luize et al. (2014), the " GOLD criteria for diagnosing COPD was the most cost effective method and provided the most accurate COPD diagnosis".

In order to diagnose COPD your physician will collect a thorough health history including, symptoms, medical and family histories, and test results (NIH, 2017b). A physician will listen to the patients lungs in order to " assess for wheezes or other abnormal lung sounds" as well as ask the patient about an " ongoing cough" (NIH, 2017b). The physician will then order a set of lung tests. These tests include pulmonary function testing and spirometry. A pulmonary function test is used to " measure the capacity of air the patient is able to breathe in and out of their lungs" (NIH, 2017b). A spirometry test is used to " measure the amount of air the patient is able to breathe out"

(NIH, 2017b). The physician may also order a chest x-ray, chest CT scan, and arterial blood gas test. The chest x-ray and chest CT scan will be used to help the physician diagnose COPD or another ailment that may be causing the patients symptoms. The arterial blood gas will " measure the amount of oxygen in the patient blood" which will assess the patients " need for oxygen therapy" (NIH, 2017b).

Plan of Action

An action plan is " a tool that is used to engage patients in behavior-change discussion with clinicians" (Health Literacy Universal Precautions Toolkit, 2 nd Edition, 2015).   Together the patient and the clinician work together to develop a plan to help fulfill the goal. In order to develop an appropriate plan of action as an advanced practice registered nurse (APRN) it is crucial that the APRN understand the cause of the disease. It is also important that the APRN addresses the disease from the appropriate level of prevention on an individual basis. As previously mentioned, the primary cause of COPD is smoking. Action plans assist in preventing hospitalization of individuals with chronic diseases.

Levels of Prevention

Primary prevention is designed to prevent the disease (CDC, 2018b). In primary prevention it is important that the APRN discuss with the community about the dangers of smoking and the damage that smoking does to your body. For patients of the APRN it is important that the APRN encourage all smokers to stop smoking, avoid tobacco exposure, and reduce workplace

smoke inhalation exposures. APRNs should encourage their patients to receive their influenza and pneumococcal vaccinations (CDC, 2018b). Secondary prevention is designed to help reduce the impact of the disease symptoms have occurred. In secondary prevention, the APRN would encourage the patient to get screened for the disease (CDC, 2018b). The APRN should make sure the patient has follow-up appointments scheduled. Tertiary prevention is designed to manage symptoms. In tertiary prevention, the APRN would assist the patient in managing their symptoms. The APRN would encourage the patient to attend pulmonary rehabilitation and take breathing treatments and other medications as prescribed.

Self-management

An APRN should encourage their patient so self-manage their COPD in order to reduce the severity of their exacerbations (Fogleman, 2018). Self-management plans assist patient with COPD to " decrease respiratory and cause-related hospitalizations and help improve dyspnea and health-related quality of life" (Fogelman, 2018). St. George's Respiratory Questionnaire (STRQ) is " used to assess quality of life", patients who had " used an action plan for COPD exacerbations had lower scores on the SGRQ than those who received usual care" (Fogelman, 2018). Practitioners should review with their patients the correct way to use the action plan to prevent and manage exacerbations.

Oral Steroids and Bronchodilators

Another action plan the APRN could implement is a plan that " integrates oral steroids into management of COPD exacerbations" (Jalota & Jain, 2016).

Studies have shown that a " 2-week therapy course was equivalent to a 6-week taper of steroids after an exacerbation" (Jalota & Jain, 2016). The APRN should implement a long-acting bronchodilators in conjunction with steroids in the patients action plan in order to promote the prevention of COPD exacerbations (Magnussen et al., 2014). This combinations improves lung function and assists in keeping patients out of the hospital.

APRNs have to work to " increase public awareness of symptoms and risk factors of COPD in order to diagnose symptomatic individuals earlier" (NIH, 2017c). The APRN should work with patients and caregivers to utilize available COPD information and tools, provide support group information, and " ways to receive free, reliable, and up-to-date COPD resources" (NIH, 2017c).

Outcome Measurement

Outcomes of these plans can be completed through the use of mailed surveys. The surveys would ask the patient about their status of smoking and if they were former smokers, their approximate quit date. It would be important that the nurse practitioner stresses the importance of medication compliance and smoking cessation at each follow up appointment.   Patients should be scheduled for follow up appointments and allotted an appropriate time frame for the APRN to complete a thorough assessment. The APRN should be prepared to follow their patients through all stages of their healthcare including hospital admissions. The APRN should allow time during appointments to let the patient ask question and respond to messages from

patients in an appropriate manner in order to build repour and make the patient feel like they are important and in control of their care.

Conclusion

In conclusion, COPD affects more than 15 million people in the United States (CDC, 2018). With a " prevalence rate of 7. 09-9. 29%", Ohio's population of people with COPD falls higher than the national average of " 5. 5-6. 3%" (CDC, 2018). Tobacco smoke, pollution, dust, and fumes can cause COPD, therefore, it is important that primary care providers are talking with their patient about the importance of smoking cessation especially in patients with asthma. Continual education is necessary for patients diagnosed with COPD in order to ensure medication compliance and decrease hospitalization rates. The number one way to attempt prevention of COPD is staying tobacco free.

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