

Breathlessness in chronic obstructive pulmonary disease



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Introduction

The objective of this work is to explore how the health deviation of breathlessness impacts on the daily life of a patient with COPD. For confidentiality purposes the pseudonym Peter will be used throughout this essay to refer to the patient. A valid consent has been obtained from Peter and a consent form is signed appropriately (please see appendix).

The essay will start with a brief clinical overview of Peter, followed by a rationale of choice of the patient and his experience of breathlessness. Next, a discussion of the pathophysiology of breathlessness and its effects on Peter will be provided. The discussion will continue with exploring the effects of breathlessness on Peter's journey through healthcare and his daily life using a holistic approach. The essay will further explore the effects of breathlessness on Peter's long term well-being and his family. Appraisal of learning gained through producing this work will also be provided, followed by a brief conclusion at the end.

Clinical overview

I was involved in the care of Peter during one of my clinical placements. Peter is a 76 years old, white British man, who was diagnosed with COPD three years ago. He is now retired after 40 years of working as a driver. The type of COPD that Peter has is chronic bronchitis with coexistent emphysema. He started smoking about a pack of cigarettes a day at the age of 19 and gave up in his early 50's. Peter's condition has deteriorated rapidly and he is experiencing increasing breathlessness and frequent

exacerbations. In the past year he has had three emergency admissions to hospital due to acute exacerbations of his COPD.

Rational for choice

The rationale for choice of Peter is because, contrary to other patients with life limiting illness I have met, he appeared to be very positive thinking with cheerful and optimistic outlook. The reason which provoked me to investigate breathlessness is because during my clinical placements I became aware that breathless patients differ in their coping mechanisms and response to treatment. After researching the deviation, I found that the experience of breathlessness, which is one of the main debilitating futures of COPD, has been compared to the experience of pain in regards to its complexity (Von Leupoldt, 2005; Nicholas, 2005). Interestingly, a recent brain imaging study has provided evidence that there are different neural pathways for the processing of affective and sensory aspects of breathlessness (Von Leupoldt et al., 2008). Considering that there are estimated 3. 7 million people having the disease (BFL, 2007), I decided that enriching my knowledge of the mechanisms and experience of breathlessness will help me to provide better care for the vast number of COPD patients in my future nursing practice.

Discussion of pathophysiology of breathlessness

Given Peter's history of smoking it could be speculated that this was the trigger for his condition, as smoking is the most ... factor for developing COPD. However, only a quarter of all smokers develop COPD (Loke et al., 2006), which is suggestive of intrinsic predisposition to the effects of smoking (Polkey, 2008). On stopping smoking the rate of decline in lung
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function is slowed down, although the damaged caused is not reversible (Flethcher and Peto , 1977). The fact that Peter developed COPD late in life could also be explained with the decrease in lung function occurring naturally with ageing (O'Donnell et al., 2007).

A complex cascade of events involving the innate and adaptive immune responses has taken place in Peter's airways leading to a state of augmented inflammation (Hogg, 2004). Current understanding is that the mechanism leading to this abnormal inflammation involves oxidative, induced by smoking, which causes a reduction of a particular nuclear enzyme (histone deacetylase 2) playing a role in the suppression of inflammatory gene transcription (Barnes, 2009).

The predominant effects of this augmented inflammation in the development of Peter's chronic bronchitis are increased mucous production pooling into the small airways (Polkey, 2008) and peribronchial fibrosis (Barnes, 2009). These changes have led to obstruction and reduction in the diameter of Peter's small airways manifesting as increased peripheral resistance (Higginson, 2010). Concurrently, Peter's emphysema development has been initiated by release of proteolytic enzymes which have destroyed components of Peter's lung parenchyma (Polkey, 2008). Furthermore, structural lung tissue destruction has been attributed to apoptosis of alveolar cells (Demedts, et al. 2006; Voelkel, Taraseviciene-Stewart & Tuder, 2004). This destruction has led to a loss of alveolar attachments and lung elasticity in Peter's lungs which has manifested as increased lung compliance (Higginson, 2010).

The combined effect of the increase in small airways resistance and lung compliance is air trapping and hyperinflation. The above changes have led to impaired gas-exchange and ventilation-perfusion disparity (West, 2003??). Here is where neuro-physiological mechanisms start to play a part in Peter's breathlessness.

Retention of carbon dioxide (CO₂) has stimulated chemoreceptors in Peter's medulla. However, chronic stimulation and compensatory mechanisms can blunt CO₂ stimulus, in which case the emphasis is on hypoxic stimulation of the carotid bodies, known as "hypoxic drive" (Mahler, 2005). Stimulation of these and some other receptors in the chest wall and lungs sends afferent signals for processing in the central nervous system which responds by initiating mechanical response to increase respiration (O'Donnell et. al., 2007). A copy of this response, known as corollary discharge, is believed to be sent to the sensory regions of the brain thus contributing to the awareness of increased effort to breathe (Mahler, 2005; American Thoracic Society, 1998). Though, the feeling of breathlessness is proposed to be a result of a discrepancy between the neural stimulation and the mechanical response, which is further compromised by inspiratory muscles' fatigue (American Thoracic Society, 1998).

During physical activity the increased need for oxygen and the buildup of lactic acid, resulting from muscle contraction, requires an increase in respiration. This puts additional pressure on Peter's lung capacity causing a dynamic hyperinflation, which creates a further gap between neural stimulation and mechanical effort resulting in a heightened sensation of breathlessness (O'Donnell, 2006).

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Acute exacerbations can be attributed to the favorable conditions for bacterial growth resulting from Peter's impaired muco-ciliary clearance and retention of secretions (Lynes, 2007??). Bacterial or viral infections exacerbate Peter's chronic inflammation leading to a sequence of increased airways resistance – further airways obstruction – impaired gas exchange – more breathlessness and occasionally hypercapnic respiratory failure necessitating hospital treatment (West, 2003??).

Client's journey through health care

Peter was feeling breathless for many years but attributed it to old age and his past smoking habit. However, three years ago he decided to visit his GP for a consultation. Breathlessness has been described as undiagnosed and largely “invisible” among patients and health care professionals (BLF, 2006??; Healthcare Commission, 2006; Gysels & Higginson, 2008). There has been a raising recognition of the need of early diagnosis of COPD (NICE, 2004; Healthcare Commission, 2006;). However, the proposed National Clinical Strategy for COPD (Great Britain. DoH, 2010) appear to aim at case finding among high risk groups. The implication of this is that ex-smokers like Peter may not be viewed as at risk of having COPD therefore opportunities of early diagnosis may be missed.

Peter was referred to the practice nurse for spirometry assessments, which are essential to confirm diagnosis of COPD (The National Collaborating Centre for Chronic Conditions, 2004 or NICE, 2004). Forced expiratory flow volume in one second (FEV1) and forced vital capacity (FVC) are the measurement taken and compared to predicted normal values. These

measurements reflect the amount of air in the lungs and how rapidly it is
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exhaled (Frankland and Lynes, 2007). FVC/FEV1 indicates the presence of airways obstruction while lower than predicted FEV1 indicates its degree (NICE, 2004).

Peter was also sent to a local outpatients clinic for a chest X-ray, which is done to exclude differential pathologist (The National Collaborating Centre for Chronic Conditions, 2004). On receiving the results, his GP made a referral to the local respiratory team. The current referral times are targeted at no more than 18 weeks (Great Britain. DoH, 2007). Shortly after Peter was diagnosed with a moderate COPD and was started on Ventolin (salbutamol) inhaler as needed, once daily on Spiriva (tiotropium) and Carbosysteïn tablets. Salbutamol is a short acting beta 2 agonist and tiotropium is a long acting anti-cholinergic drug (BNF, 2010). Both drugs are bronchodilators proved to reduce breathlessness by improving FEV1 and FVC, tiotropium also reduces exacerbations (NICE, 2004; Sestini et al., 2009; Bar, Bourbeau & Camargo, 2008). Carbosysteïn is a mucolytic facilitating breathlessness by thinning viscous secretions (BNF, 2010). As a part of exacerbation prevention Peter was given vaccinations and a dose of antibiotics as a backup at home (NICE, 2004).

Peter was also referred to a local pulmonary rehab clinic which among many activities offers exercise training in order to improve exertional breathlessness and quality of life (Goldstein, Lasserson & Martin, 2009). All COPD patients should be referred (NICE, 2004) and it is now widely available across the country (Royal College of Physicians, 2008). On completing the venue Peter was very pleased as his breathlessness had improved however since then he has stopped exercising. Peters' withdrawer of physical activity <https://assignbuster.com/breathlessness-in-chronic-obstructive-pulmonary-disease/>

can be explained with the role of the “ affective dimension” of breathlessness which causes behavioral responses creating a vicious circle of deconditioning – breathlessness – deconditioning (Lansing, Gracely & Banzett, 2008 or ?? O’Donnell et al., 2007; American Thoracic Society, 1998).

About one year ago Peter developed a chest infection which did not respond to an antibiotic treatment. Eventually, he had to be admitted to hospital due to an increased feeling of suffocation and anxiety. A qualitative study done by Bailey (2004) concludes that increasing anxiety correlates with the severity of acute breathlessness and is a way of “ visualising” breathlessness and “ legitimising” help seeking behavior such as hospital admission.

At hospital Peter was closely monitored and among other treatments and tests he received oxygen and blood sample was taken for arterial blood gas analysis which can detect hypercapnia and hypoxia (West, 2003).

Supplemental oxygen is given to correct hypoxia, however it requires careful monitoring and flow adjusting to prevent possible hypoxic drive suppression and consequential respiratory acidosis (West, 2003). Ultimately, Peter had to receive non – invasive ventilation (NIV), which he explained as a “ medieval mask” that he could not bear and tried to remove it. NIV is indicated to treat persistent hypercapnic respiratory failure and it should be available in all hospitals admitting COPD patients (NICE, 2004). However, a recent COPD audit has found that it is not available in all units, some lacked inter-professional training and ?? adequate information to patients (Royal College of Physicians, 2008).

Peter was discharged approximately a week later and a Seretide inhaler twice daily was added to his treatment. This is a combination inhaler of long acting beta 2 agonist (salmeterol) and a steroid (fluticasone propionate) (BNF, 2010). It has been found that this combination reduces COPD exacerbations (Nannini et al., 2010). Additionally, a backup of Prednisolone tablets were given to him for more effective exacerbation treatment (NICE, 2004). Peter experienced two more acute hospital admissions of similar experience. After the last one he was referred to a community matron. Community matrons provide care and support to people with chronic conditions in the community (DoH, 2001??). I met Peter at this point.

The effects of breathlessness on the long term well-being of Peter and his relatives

Currently Peter cannot walk for more than 5 meters without becoming breathless. For that reason, he avoids leaving home or uses a wheelchair when necessary. This has prevented him from enjoyable activities such as meeting his friends at the local pub and playing golf. Some of his friends visit him at home. He now enjoys watching television and has a television set in every room including his bathroom. He likes having his medications, and commonly used belongings arranged within easy reach. He says that he appreciates every day as it comes however he acknowledges the possibility of further deterioration and possible death.

Peter's withdrawal from social activities outside his home could be considered with the concept of stigma, proposed by Goffman (1963), which assumes that when individuals fail to meet certain expectations from society they become labeled as "deviant". Scambler (2004) proposes that these

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individuals may start to experience “felt stigma”, which is the individual perception of being devalued, unacceptable and ashamed (Stuenkel & Wong, 2009). Consequently, this could lead to isolation. The theme of loss and social isolation reported in the qualitative literature could be summarised in several levels: loss of the normal function to breath, loss of social connections and loss of effectiveness to self and others (Leidy and Haas, 1999; Gullick & Stainton, 2007; Harrys, Hayter & Allender, 2008). These levels coincide with some aspects of the International Classification of Functioning, Disability and Health (WHO, 2002).

Although, it is reasonable to say that Peter experiences a certain degree of felt stigma and isolation from his story there is an impression that he has somehow adapted suggested by his life style changes. Adaptation and coping are considered necessary for successful self-management of chronic disease (Larsen & Hummel, 2009) and is presented in several phenomenological studies discussed next.

A study with a sample size of 36 patients between 28 and 81 years of age (17 with COPD and 19 with asthma) revealed that breathlessness and the associated fatigue required coping mechanisms such as energy conservation and attempts to maintain a normal life within the limitations of the symptoms (Small & Lamb, 1999). The study concluded that most participants coped well. However, majority of the patients included in the study had asthma which may mean that they did not experience breathlessness as persistently as COPD patients; also there was a great age variation of the participants. Another study with a sample size of 15 patients with severe emphysema and 14 carers, found similar coping strategies to Small & Lamb <https://assignbuster.com/breathlessness-in-chronic-obstructive-pulmonary-disease/>

(1999) (Gullick & Stainton, 2007). The study suggested that the patients needed constant planning of activities, body management and awareness of own limitations. One of the limitations of the study is that seven of the patients had previously experienced hospital admissions for other chronic problems, which may have affected their coping with emphysema. Another study with a relatively small sample size of 10 patients with COPD have suggested that losing and re-gaining control as an on-going event for these patients (Fraser, Kee & Minick, 2006). All of the three studies were done outside the UK but could be applied to patients in this country because they address ordinary daily challenges.

Peter lives in his own home with his wife who is his main carer. Although, they admit that the daily chores are a challenge they rejected any help from social services. Peter enjoys visits from his twin daughters and grandchildren mainly over the weekends. His daughters are worried about his health and the strain of informal caring on their mother.

The ill person is provided protection from other family members; often the woman adopts the care giving role (Kanervisto, 2006). The effects of breathlessness on informal caring are addressed in several phenomenological studies. Some of the emerging themes are difficulty in managing daily lives, neglect of carer's own health, loss of intimate closeness, psychological wear out and powerlessness during acute breathlessness (Bergs, 2001; Gisels and Higginson, 2008). Themes such as losing – regaining control and isolation coincide with these experienced by the patients (Bergs, 2001; Gisels and Higginson, 2008). A study done by Bergs (2002) constructed of 6 exploratory interviews of COPD patients' wives <https://assignbuster.com/breathlessness-in-chronic-obstructive-pulmonary-disease/>

living in Iceland but it could be applied to the UK in the same way as the previously discussed studies. Despite, the small sample size, the findings could be considered significant because they provide a reason for the continued willingness of the wife career to carry on looking after her husband, despite the difficulties. That is, that fulfilling her role as a career brings value into her life.

Learning Gained

The process of producing this work revealed several interesting points which will be beneficial in my future nursing practice. I participated in a pulmonary rehabilitation meeting from where I learned how physical training can help COPD patients. Also, I learned more about non-pharmacological management of COPD such as diaphragmatic breathing. I now feel more confident about giving such advice to patients which is due to understanding the rationale behind it. Also, the research I conducted helped me to better understand the role of pharmacology on the pathophysiology of breathlessness. Therefore, in the future I will be able to comprehensively explain it to patients, which in turn can influence their medication concordance.

Conclusion

This essay considered the effects of breathlessness on Peter, a patient with COPD. The pathophysiology of breathlessness considered causative factors, structural changes, neuro-physiological mechanisms and the affects of acute exacerbations. The journey through healthcare reflected on Peter's experience from the onset of breathlessness through to diagnostic tests, medications, hospital admissions and supportive services. Some of the long-
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term effects were considered in relation to the concepts of stigma, social isolation and successful adaptations. The strain of informal caring on Peter's wife was also discussed. The learning I have gained in the process will strengthen my nursing knowledge and skills. Overall, this work reflected on some of the multidimensional effects of breathlessness on those affected by COPD.