

## **COPD Exacerbations: complex and multifaceted.**

Chronic obstructive pulmonary disease (COPD) is a complex and progressive condition that is characterised by a range of disabling symptoms and it is considered that the UK has in excess of 3 million people diagnosed with COPD (GOLD 2013). The incidence rates are also increasing and current figures demonstrate that those diagnosed with COPD increased by 27% in the last decade (British Lung Foundation 2016). Whilst COPD mortality in 2012 showed a 5% increase from 2008 and a 10% increase from 2004 (British Lung Foundation 2017: British Thoracic Society 2006). These figures identify that COPD prevalence is increasing, and may be due to a range of reasons including smoking, increasing pollution, also the UK has an ageing population, and the association with age related pulmonary changes can increase the susceptibility to COPD (Fukichu 2009).

A COPD exacerbation has been defined as an acute event in the disease and symptoms are characterised by alterations in the patients baseline dyspnoea, cough and sputum, which are outside of the normal day to day variations (GOLD 2017). Between 70%-80% of exacerbations have a trigger such as viral or bacterial infections, whilst the remaining 20%-30% are related to environmental issues such as pollution or unknown aetiology (Sapey & Stockley 2006). The frequency of exacerbations are understood to be indicative of COPD progression and the stage that the disease has reached, also the focus for management of COPD is often upon the reactive containment or 'rescue care' of an exacerbation of COPD as opposed to the proactive focus of the condition (Bodenheimer et al 2005: Coulter et al 2013). However, monitoring a condition by the level of exacerbations could be deemed a 'failure' of disease management and considered an unusual method to employ to determine a person's current health status (Fromer 2011).

Ongoing disease progression can affect an individual's mobility, work, social life, sleeping and eating. Also exacerbations are recognised as part of the natural course of the disease and considered to be the major drivers and deterioration markers of the condition (GOLD 2011). This paper seeks to identify some of the historical and current issues related to COPD exacerbations in the UK.

Current research suggests that detection of COPD in its early stages and stabilisation of disease progression can assist with an optimal outcome and reduce exacerbation frequency (Merinopoulou et al 2016). However, symptom changes can be complex and difficult to recognise, and patients do not always appreciate that their condition is deteriorating (Koff et al 2009). Added to which many patients who are symptomatic in the early stages of an exacerbation, do not understand the importance of seeking help early. Many patients appear as a hospital admission during an exacerbation unaware that their condition has deteriorated, whilst some accept the symptoms of exacerbation as a typical pattern in their condition, and post exacerbation is considered to be a 'return to normal' (Pinnock et al 2011). In many cases an exacerbation emergency is often the first presentation of a previously undiagnosed COPD which is symptomatic (Fromer 2011). The symptoms can also be ambiguous as they are often associated with multiple factors including seasonal variability which adds to their complexity and range, and may require a variety of treatments. (Donaldson et al 2014: NICE 2010).

It has been estimated that two thirds of COPD exacerbations are unreported (Langsetmo et al 2008). Therefore patient empowerment and the knowledge to adjust medication and treatments and prevent further deterioration may be 'lost' (GOLD 2017). Whilst a more recent study by Jones et al (2014) identified lost opportunities for early COPD diagnosis both in primary and secondary care citing a range of reasons including a lack of public understanding and education of the condition as a factor.

### **Under diagnosis of exacerbations**

Under diagnosis of COPD affects the accuracy of current figures. It is estimated that of the 3 million people with COPD in the UK, only about 835,000 are registered. These facts provide a picture of the overall UK disease burden. An audit of patients admitted to hospital for an exacerbation of their COPD revealed that 50% of these did not have a documented COPD diagnosis ((Balcells et al 2015). This is especially the case with those who are not frequent attenders or whose health services are not easily accessible (Bastin et al 2010). Sub optimal care or a lack of treatment for an exacerbation is at odds with the recommendations of an aggressive and prompt approach to care management, to promote symptom control, slow the disease progression and assist in maintaining quality of life (NICE 2010). Tight monitoring of COPD is required to prevent deterioration because, as the condition progresses and worsens the exacerbation incidence tends to increase (GOLD 2007: Celli 2004: Merinopoulou et al 2016).

### **Impact of exacerbations on lung functioning**

COPD exacerbations are considered to be the major indication of disease progression and a factor for hospital admission. Several studies have identified a COPD 'phenotype' detecting that COPD exacerbations are not random episodes but form cluster patterns, in which there is an increased risk of a recurrence or exacerbation in the 8 week period post an exacerbation. The frequent exacerbation phenotype is associated with a history of gastro-oesophageal reflux, elevated white cell count and poorer quality of life (Hurst et al 2010).

Those patients with higher rates of exacerbations also experience an increased decline in their lung function, which tends to augment the severity of the underlying COPD, and includes symptoms such as increased breathlessness, a reduction in normal activities and exercise and a general deterioration in health. Unsurprisingly this group of patients are known to require more frequent medical attention than those who seldom have exacerbations (Miravittles et al 2013). COPD exacerbations are recognised not only as the major drivers of COPD progression but also reliable predictors of potential occurrences affecting lung function. The higher the COPD staging on the Medical Research Council Classification the greater the chances of an exacerbation (Fletcher 1960:Hurst et al 2010).

The more severe and symptomatic the exacerbation the slower the recovery and greater the potential for further episodes. Frequent exacerbations take their toll and are associated with a swifter reduction in lung function which can then take weeks to return to baseline, (Vestbo et al 2011: Donaldson et al 2005).

Various studies have demonstrated that the length of post exacerbation recovery rate is a factor affecting the overall health of the patient. A study by Donaldson et al identified that 7.3% of the sample had a prolonged exacerbation recovery of up to 99 days (Donaldson et al 2014). The length of recovery rate in those with COPD may be protracted, if accompanied by other co morbidities. These can include cardiac failure, fatigue, anxiety, depression, to name a few but all add to the disease burden (Miravittles et al 2013). Halpin cited by Powers (2012) suggested that it is not clear whether it is the effect of frequent exacerbations or general decline of the patients health that is the greatest contributor to more frequent exacerbations (Powers 2012). However, this supports the view that COPD evolves from a condition limited to pulmonary function, to that of a more complex

disease with associations to systemic inflammation and other long term comorbidities (Clini et al 2013).

### **Cost of care**

The effect of exacerbations have historically imposed a substantial burden on health care systems worldwide (GOLD 2011:Seemungal et al 1998). In its recent 'Battle for Breath Report' (2016) the British Lung Foundation included figures demonstrating that mortality from COPD in 2012 was 5% higher than in 2008 and 10% higher than in 2004. The report also identified that nearly 300,000 people die from COPD each year. It has been estimated that repeat hospital admissions account for between 40%-75% of the total health related cost of treating those with COPD ( Doos et al 2014). Whilst the median costs of COPD patients with multiple co morbidities has been found to be 4.7 times higher compared to those with COPD but without co morbidity (Darnell et al 2013). The admission rates to acute units, also have a correlation with several factors which include socio-demographic deprivation, inaccessibility of health care services, and those patients who are infrequent attenders. (Bastin et al 2010: British Lung Foundation 2017). Social deprivation is particularly significant aspect of the condition, and it has been estimated that medical practices covering the areas of the most deprived populations demonstrate acute admission rates between 60-90 percent higher than more affluent areas (British Lung Foundation 2017:Purdy et al 2010a). Significantly it is estimated that up to half of patients discharged after a hospital admission due to COPD will die within two years of their episode of care, whilst 15% die within 3 months (Department of Health 2011: Hajizedeh et al 2014).

The governments Five year forward Plan identified preventive strategies and public health as major aspects of disease management, and within COPD management there are a range of proactive measures and influencing factors in the rate of disease progression (DH 2011). These include smoking cessation, vaccinations, maintenance drug therapy, physical activity and also pulmonary rehabilitation all of which are recognised as having a role in the reduction of exacerbations (GOLD 2011:Godtfredsen et al 2008). Smoking cessation has been described as having the greatest capacity to influence the course of COPD, and promoting this aspect of COPD management to patients, can assist in reducing the potential for exacerbations as it slows the accelerated rate of lung deterioration and improves survival rates (Au et al 2009).

However, the unpredictable and uncontrollable nature of acute COPD exacerbations can increase issues of anxiety and in some cases denial, or a reluctance to accept the diagnosis. Some people have described themselves as feeling powerless in response to overwhelming symptoms at the time of an acute exacerbation or ill equipped with facts regarding their condition, increasing personal anxieties (Dodd et al 2010). Health care professionals have been described as having a key role in assisting and empowering, by providing support helping a patient to assert control over their condition, and involve them in partnership working. This highlights the value of pulmonary rehabilitation which includes an individualised holistic assessment and exercise programme, and has been identified in the promotion of a positive impact on a patient's quality of life to promote patient education and self-management (BLF 2014)).

## Conclusion

The UK's ageing population, has been identified as just one of the factors for the increase in people living with COPD (Fukichu 2009). However the causes of COPD exacerbations are complex and comprise a range of issues. These include to name but a few, under diagnosis of COPD, inaccessibility of health care services, also a poor understanding of those with COPD who struggle to manage their condition (Baird 2016:Hurst 2010). It is recognised that emergency care is not an effective strategy in maintaining pulmonary health, neither is it an optimal approach for managing a patient's level of function, or affecting the course of the disease. Yet this is the time that patient's with worsening disease symptoms tend to be admitted to the acute environment (Anzueto 2010). The Government's health agenda is focused on disease prevention and health promotion (DH 2011). To achieve this relies upon a range of accessible services in primary care to reduce COPD hospital admission rates. A few have been mentioned and include pulmonary rehabilitation to enable education of the individual and assist in transforming care delivery from 'rescue care' to planned care (Bodenheimer 2005; Koff et al 2009). The ultimate goal being empowerment, education and assistance for those with COPD in order for them to manage a condition that can be relentless and in many cases 'life changing'.

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