

**COPD 2018- Possibilities of early detection of COPD exacerbations-Helena Binetskaya-Healthy Networks, Belarus****Helena Binetskaya***Healthy Networks, Belarus*

COPD exacerbations contribute significantly to the total COPD burden on the healthcare systems due to considerable morbidity and mortality associated with COPD. At the same time, it is now recognized that many exacerbations are delayed to be reported or are not reported at all to healthcare professionals. Chronic obstructive pulmonary disease (COPD) is the world's most common chronic pulmonary condition, and a significant cause of morbidity and mortality. Exposure to tobacco smoke or other air pollutants in susceptible individuals leads to inflammation in the small airways and progressive destruction of the lung parenchyma, which results in a decrease in lung function out of proportion to normal decay. The manifestations of this disease are heterogeneous, resulting in a broad variety of clinical phenotypes, as reflected in the latest update to the Global Chronic Obstructive Lung Disease Initiative (GOLD) criteria, which recognizes a major dichotomy in the COPD population in terms of the relative frequency of acute disease exacerbations. Traditional wisdom has identified COPD as a chronic disease that responds poorly to care, with smoking cessation being the sole intervention capable of changing the path of disease progression. However, recent studies have called into question these axioms.

The era of most rapid decline in lung function can occur much earlier than previously believed, and it is during this time that proactive testing strategies, smoking reduction measures and treatment initiation can be advantageous. Reflecting this, modifying our current diagnostic approaches and adopting alternative modalities may allow patients with diseases to be identified earlier. This early recognition may also allow practitioners to adequately recognize exacerbations of a chronic lung disease, while they may initially be labeled as having multiple acute disease outbreaks (e.g., bronchitis) without this defined diagnosis. In addition, early pharmacological therapy initiated during COPD (in addition to cessation of smoking) may change the rate of progression of disease. Of these reasons, identifying and acting on an early COPD diagnosis is a crucial step towards reducing this disease's substantial morbidity and mortality. As mentioned above, COPD is the most common chronic lung disease in the world with an estimated pooled prevalence

of 7.6%–8.9%.<sup>18</sup> Several generations have passed since the impact of cigarette smoking on chronic lung disease was first recognized, yet worldwide smoking rates have not declined universally. For example, although smoking levels have declined dramatically in the United States and Canada over the past 50 years, levels in many nations in Asia and Africa remain extremely high. Moreover, perhaps because of the long lead time taken to develop clinically relevant COPDs, even in areas where smoking rates have declined, COPD has yet to decline as dramatically. To explain this effect, in the past 20 years, several major survey-based studies have examined improvements in the prevalence of obstructive lung disease (and, specifically, COPD) in the US. Ford et al compared data from the 1988–1994 and 2007–2010 National Health and Nutrition Surveys for adults aged 20–79. They found that the average age-adjusted prevalence of any obstructive lung disease in 2007/2010 was 13.5 per cent, compared to 14.6 per cent in 1988/1994 ( $P=0.178$ ). Of concern, a high percentage of moderate (48.4 per cent) and severe (37.9 per cent) obstructive lung function participants reported that they continued to smoke.

They found a self-reported COPD incidence of 6.5 per cent in 2011, demonstrating a small linear decrease in prevalence over the period of study. Tariffs were higher in females (which was found in other studies where COPD prevalence is self-reported as opposed to studies based on objective data, typically showing higher prevalence in men). Significant regional differences were also observed, with a higher prevalence of COPD, COPD hospitalizations, and COPD mortality in the Southern states and in the Ohio River Valley, compared between 1999 and 2011.

In summary, these population-based findings indicate that at given some positive changes in cigarette smoking levels and lung disease prevalence, COPD is a major public health burden largely unrecognized by those it affects. Until recently, much of the information available on COPD prevalence has concentrated on the developed world; however, many developing world regions (e.g., China, India) have both very high rates of smoking and non-tobacco-associated COPD.

They found a prevalence

of 8.2 per cent overall. Importantly, only 35 percent of the survey participants

had previously been diagnosed with spirometric evidence of COPD. In addition, the prevalence of COPD was higher in rural residents and those with less education and poor ventilation in the kitchen, suggesting an increased risk for patients with low socioeconomic status. This results in significant impact on exacerbation outcomes, hospitalization, and health status. Early detection and prompt treatment of COPD exacerbation can reduce their impact on health status and health care utilization. **Methodology & Theoretical Orientation:** LungPass<sup>TM</sup> an innovative device that can be used for early detection and monitoring of lung conditions, including COPD exacerbations. It works on the basis of lung sound detection using a digital stethoscope with a subsequent evaluation of auscultation data and questionnaires (including symptoms, peak expiratory flow rate (PEFR), adherence to therapy, etc.) through a developed mobile application. The first step of our study after the algorithm development was evaluation of its accuracy in lung sounds detection compared with <sup>TM</sup>gold standard<sup>TM</sup> and individual practitioners. The second step will be assessment of the possibility of using the device for early detection COPD exacerbations and managing them in cooperation with healthcare providers. **Findings:** 300 audio records from patients with bronchitis, pneumonia, asthma and COPD were classified by the developed diagnostic algorithm and the overall classification accuracy was 90.8% (for normal breathing sensitivity (Sn): 82%, specificity (Sp): 99%, for wheezes+rhonchi Sn: 93%, Sp: 99%, for coarse crackles+fine crackles Sn: 98%, Sp: 90%). To date, a study protocol for second step of our research has been developed. **Conclusion & Significance:** The developed device and app demonstrated high lung sound classification accuracy and together with analyzing change of symptoms, daily activity, using of short-acting bronchodilators, PEFR, etc. may be used for monitoring and early detection of COPD exacerbations. **system issue in the liver.** In this article, we will concentrate on hepatic infection contaminations, hepatocellular carcinoma and immune system issue as guides to represent the present comprehension of the commitment of T cells to cell resistance in these diseases. Cell safe concealment is basically answerable for constant viral diseases and malignancy. Be that as it may, an uncontrolled auto-receptive invulnerable reaction

represents autoimmunity. Therefore, these safe variations from the norm are attributed to the quantitative and practical changes in versatile insusceptible cells and their subsets, intrinsic immunocytes, chemokines, cytokines and different surface receptors on invulnerable cells. A more noteworthy comprehension of the mind boggling coordination of the hepatic versatile insusceptible controllers during homeostasis and safe fitness are truly necessary to recognize applicable focuses for clinical intercession to treat immunological scatters in the liver.