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The Use of Population Attributable Risk to Estimate The Impact of Preventive Interventions of Smoking Cessation in Chronic Obstructive Pulmonary Disease(COPD)

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Dear Editor,

Chronic pulmonary disorders are a set of diseases that restrict respiration airflow(1).Most of these diseases are chronic obstructive pulmonary disease (COPD)(1). According to the WHO report, mortality from COPD is increasing worldwide. It is expected to be the third leading cause of death worldwide by 2030(2) (the sixth leading cause of death in 1990(3). This disease causes significant costs for health systems(4). There is strong evidence between COPD and smoking as a major risk factor. Smoking cessation is the most effective measure to prevent or slow COPD progression (2,5).

The effect of smoking on COPD was assessed in selected studies using the odds ratio (OR). The data analysis results using the random effects method showed that the risk of COPD was higher in smokers and those exposed to cigarette smoke.(current smoker; 95% CI: 0.78 – 4.31, **OR: 1.83**, Ex-smoker; CI: 1.05 - 4.98, **OR: 2.29**, passive smoker; CI: 0.43_3.08 , **OR: 1.15**)(3,6).

According to the results of the 7th national survey of non-communicable disease risk factors (Steps 2016),the distribution of current smokers, ex-smokers, and passive smokers were 9.71, 14.63,and 31.53 among over 18 years old, respectively(7). Furthermore, the population attributed risk (PAR) of each factor with Levin formula (PAR=P(OR-1)/P(OR-1)+1) is 0.89%, 0.95%, and 82.5%, respectively, which indicates when smoking would eradicate in populations, we can propose to lower up to almost 90 % in the population's COPD.

After reviewing the studies on smoking cessation interventions, the most effective smoking cessation drug is Varenicline(8,9). A well-designed randomized controlled trial in patients with COPD found that 18.6% of the control group developed bad consequences, compared with only 5.6% of those receiving treatment(8). Absolute Risk Reduction (ARR), also called risk difference (RD), is the most useful way of presenting research results to help your decision-making. In this study,

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ARR was 13% (18.6% -5.6% =13%), which means that, after 100 patients treated, 13 would be prevented from developing bad outcomes. Another way of expressing this is the number needed to treat (NNT) the number of people who must be treated to benefit one person. It is the inverse of absolute risk reduction. If 13 patients out of 100 benefit from treatment, the NNT for one patient to benefit is about 8 (100 ÷ 13 = 7.69). So, about eight people must be under the gown, smoking cessation up to one people, and cessation will be succeeding. According to current smoking prevalence (9.71) and population over 18 years old of Yazd province (718514), we can estimate about 69505 people are current smokers in Yazd province, so if we plan for smoking cessation intervention on all of them, we can prevent 8668 COPD cases in Yazd province. For getting to WHO goals up to 2025, if we want to decrease 30 percent smoking (about 20851 smokes), we must perform a smoking cessation program in 166812, so we can cause smoking cessation in 20851 smokers (30% of 69505 smokers in Yazd province).

In this study, we reviewed the most important risk factors by reviewing articles related to COPD, assessed the risk associated with the disease, and then reviewed the most effective interventions performed in this case. According to the findings of this study, the high impact of smoking on COPD can be understood. Therefore, health policymakers should consider COPD as a health priority and consider programs to reduce smoking and exposure to smoke, thereby reducing the incidence of COPD.

Author contribution

SM.N presented the idea of this article. Z.J and S.A reviewed the texts, analyzed and wrote the article, under the supervision of the SM.N. All authors approved the final version.

Conflict of interest

The author does not have any conflict of interest.

Key words

Population attributable risk, preventive interventions, smoking cessation, COPD.

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