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The Salford Biomedicine Society Magazine

Smoking and vaping – preventing and quitting – NHS 2024

Aribah Mirza

Smoking prevalence

Although the prevalence has reduced in recent years, tobacco smoking is still one of the main causes of premature death and diseases worldwide. Many smokers acknowledge the harmful effects to their physical health yet continue to smoke. The reason being that nicotine in cigarettes in highly addictive, making the negative consequences associated with smoking easy to overlook[12].

It has been estimated by the World Health Organisation (WHO) that in the 1990s, there were approximately four million tobacco-related deaths per year worldwide. This estimate increased to around five million in 2003, six million in 2011 and is expected to reach eight million per year by 2030[2].

Health implications and pathophysiological features related to cardiovascular disease and smoking

Cigarette smoking is associated with increased mortality and morbidity. Smoking is associated with increased risk of cardiovascular diseases, as well as respiratory disorders such as emphysema and chronic obstructive pulmonary disease (COPD).

There are several pathophysiological features that contribute to cardiovascular disease, a significant risk factor caused by cigarette smoking. A mixture of toxic chemicals including nicotine, carbon monoxide and oxidant chemicals found within cigarette smoke are involved in the pathogenesis of cardiovascular disease. Nicotine is a central nervous system stimulant and expresses its cardiovascular effect by increasing heart rate, blood pressure and cardiac output. Myocardial oxygen demand is increased as a result. Carbon monoxide exposure to patients with coronary artery disease can cause adverse effects such as increased ventricular arrythmias, ventricular dysfunction and exercise-induced ischaemia. Substances that may play a leading role in developing atherosclerosis would be oxidant gases. The presence of oxidising chemicals, including nitrogen oxides and free radicals, in cigarette smoke is a primary cause of endothelial dysfunction in smokers[8].

Furthermore, tobacco is the main substance causing inflammation, endothelial dysfunction, changes to lipid profile and insulin resistance. These all work together as pathobiological mechanisms for atherothrombosis which is a major cause of cardiovascular death[11].

DOI: https://doi.org/10.57898/biosci.57

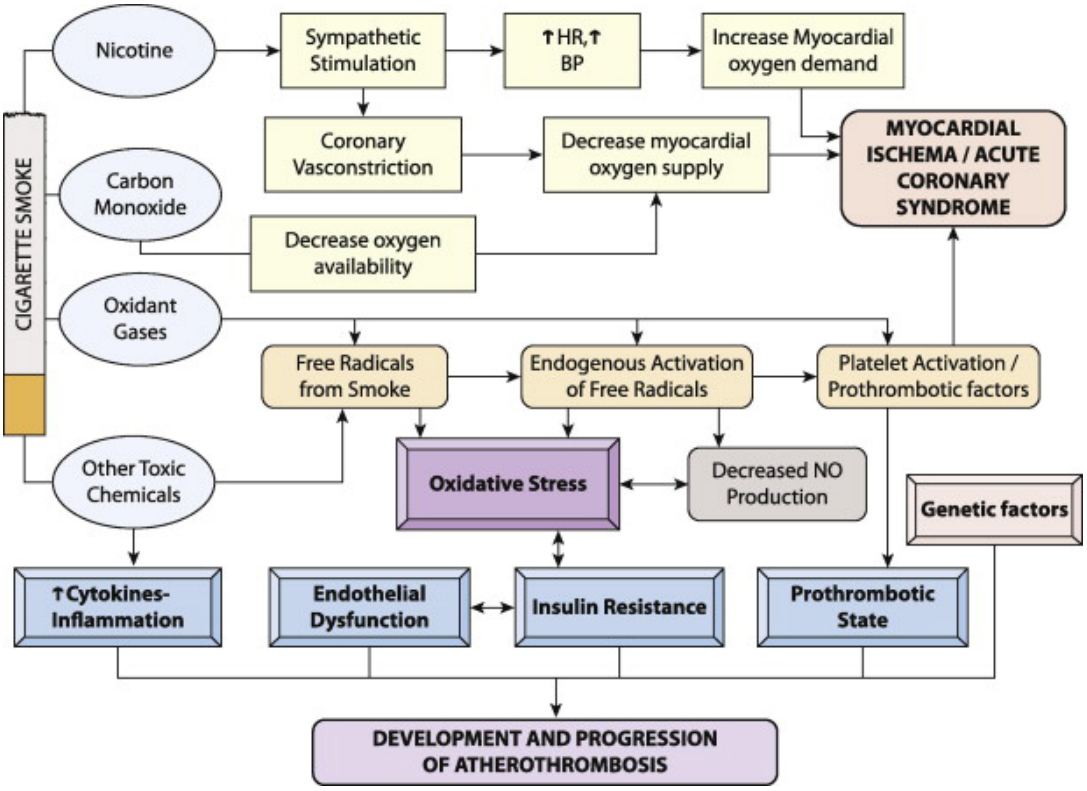

Figure 1: Summary of various pathophysiological mechanisms of tobacco in developing cardiovascular disease. BP, blood pressure; HR, heart rate; NO, nitric oxide[8].

Smoking during pregnancy causes the risk of complications such as miscarriage, stillbirth, premature birth, foetal growth restriction and a group of congenital abnormalities are also significantly increased[10].

Smoking tobacco can lead to a variety of diseases including lung, stomach cancer or ulcers, pancreatic, kidney, cervical and ovarian cancer, as well as leukaemia[9].

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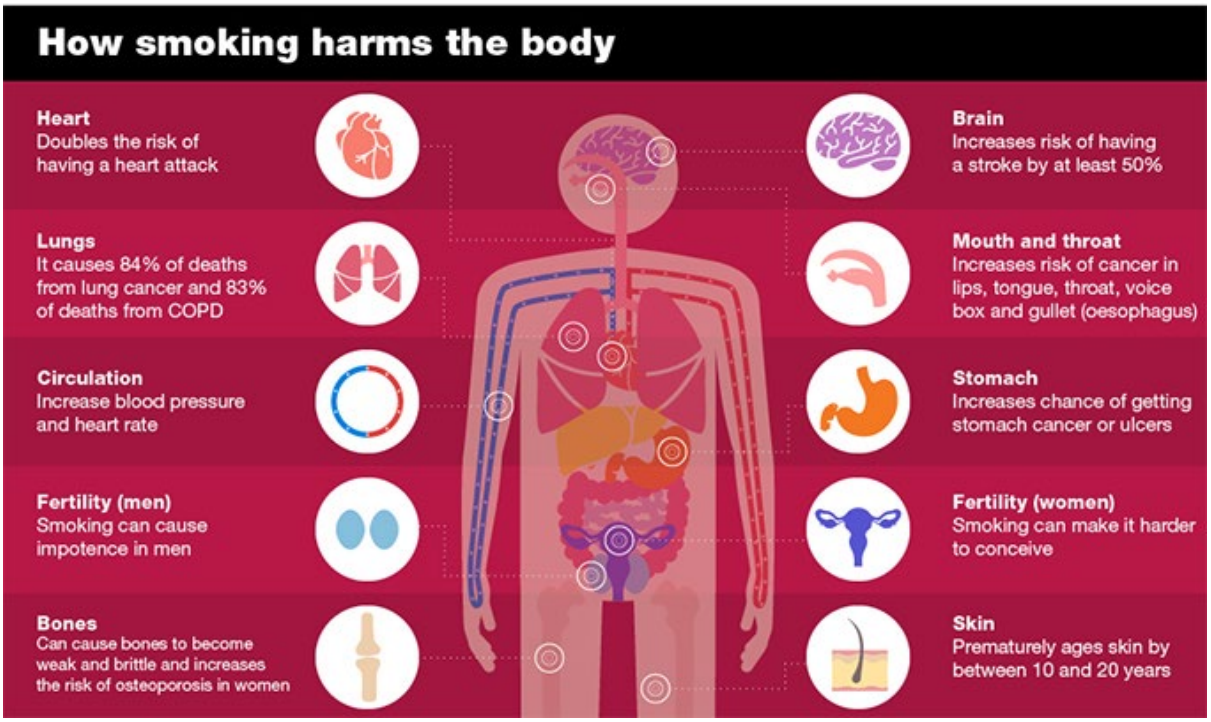

Figure 2: Impact of smoking on health[7].

Vaping to quit smoking

One of the most effective methods of quitting smoking is nicotine vaping. E-cigarettes are electronic devices which allow you to inhale nicotine as a vapour rather than smoke. E-liquids are available in various strengths of nicotine and can be controlled to help with withdrawal symptoms. By reducing the health risks of smoking cigarettes, vaping can help to achieve this. It is effective if expert help is gained from an individual's local Stop Smoking Service. Advice about the right device and nicotine strength can be given.

Even though nicotine vaping had previously been an effective method of quitting smoking, the *New England Journal of Medicine* reported several outbreaks of acute respiratory failure among electronic cigarette users in 2019. Inhalation of toxic environmental agents from electronic cigarettes causes injury to the airways and lung parenchyma. The outcomes of these lung injuries are dependent on the dose of inhaled toxic compound, solubility, and chemical composition. Patients may develop a range of symptoms dependent on these factors including minor respiratory tract discomfort, acute airway injury and damage, parenchymal pneumonitis, alveolar oedema, hypoxemic respiratory failure, and death[6].

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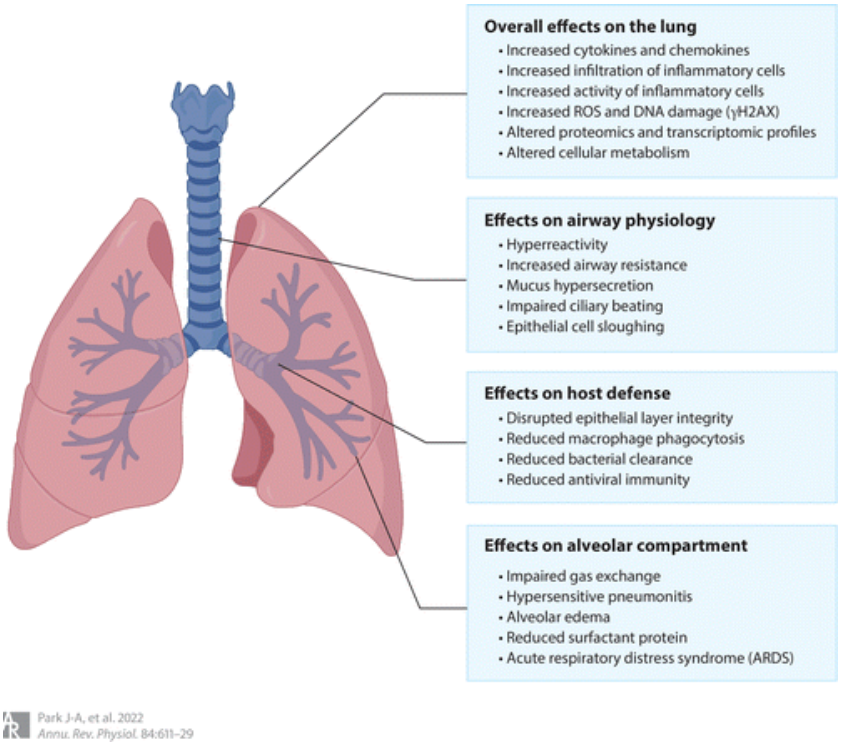

Figure 3: Mechanistic overview of adverse effects of electronic cigarettes on the lungs. As a primary organ, the lung is damaged and impaired by electronic cigarette use[6].

Long-term effects of vaping are still unknown and common side-effects include mouth and throat irritation, shortness of breath and coughing or a dry throat[4]. Furthermore, research has shown that electronic cigarettes cause adverse respiratory effects such as increasing the chances of pneumothorax (total or partial collapse of the lung)[6]. This is due to the toxins within the vapour such as nicotine and non-nicotine compounds which are associated with lung epithelial cell injury and inflammation[13], Therefore, smoking cessation programmes may be more useful to quit smoking altogether[4].

Smoking cessation

Reinforcing the necessity of quitting smoking can be done by repeated consultation and smoking cessation services. Furthermore, counselling by health workers can increase the rates of quitting smoking. These methods of intervention have been shown to be effective as they are provided by healthcare providers that are able to maintain a good relationship with smokers and are therefore trusted by the public. As well as clinical counselling, medication can be used as an effective treatment. This includes nicotine replacement therapy (NRT) such as patches, gums, inhalers, and nasal spray[3].

Vaping as a smoking cessation aid could be considered if a smoker is still struggling to quit despite undergoing counselling, NRT and prescription medication. However, it is necessary that they are well-informed of the negative aspects of vaping. Whilst the use of e-cigarettes may be advantageous for smokers to quit, it is important to ensure that public health policies do not attract younger non-smokers. This can be done through various policies such as taxation, flavour bans, advertisement, and age restrictions[1].

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Figure 4: Range of quitting methods and their effectiveness[7].

NHS 2024 Smoking Cessation Service for patients

In line with the NHS long term plan to make England smoke-free as a society, acute NHS trust patients with a Tobacco Dependency service will be offered smoking cessation support. All individuals admitted to hospital should be offered NHS funded tobacco treatment services by March 2024. Follow up after patient discharge and 12 weeks of smoking cessation support is given to patient who have had their smoking status determined. Acute NHS trusts can refer patients to a chosen pharmacy so they can receive continued treatment, support, and advice to quit smoking when discharged. One of the problems with this service is that only patients who have been referred from an acute NHS trust during their discharge will be eligible to receive advice and treatment. However, it aims to decrease morbidity and mortality from tobacco cigarette smoking as well as addressing the gap between secondary and primary care handover. Patients will be offered ongoing consultation as well as Nicotine Replacement Therapy, which must be provided by a trained pharmacist[5].

In summary, smokers looking to quit may look towards smoking cessation services such as NRT and various medication. However, if there is a failure to do so, vaping may be introduced as a smoking cessation aid if the individual is well-informed of the side-effects including the damages it can cause to lung epithelium. To overcome this situation, the NHS has decided to offer patients smoking cessation support as of 2024, the only shortcoming being that acute NHS trusts are able to refer patients to this service.

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