

ELECTRONIC CIGARETTE: A SUBOPTIMAL INHALATION DEVICE

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Electronic cigarettes (EC), also known as electronic nicotine delivery systems (ENDS), become a popular substitutes of classical tobacco products. Simultaneously, they can be considered as useful in smoking cessation. There is still a lack of firm knowledge on EC performance as inhaling devices. Aim of this contribution is to characterize EC from such perspective.

Selected ECs have been experimentally tested in respect of the (i) aerodynamic resistance during inhalation; (ii) size distribution of emitted aerosol. Experimental data have been used to predict the regional deposition efficiencies of inhaled mist using the selected computational models.

It was found that internal resistance of ECs to flow is several times higher than of high-resistant medical inhalers (DPIs). Almost all droplets emitted from ECs are smaller than 1 μm , so their size does not assures effective deposition in any part of the respiratory system. Consequently, more than 50% of inhaled aerosol is exhaled (what can be visually detected). It can be concluded that ECs are suboptimal inhaling devices, however they allow to deliver nicotine to the organism in a generally safer way than traditional tobacco product.

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