

Nasal long-term inhalation facilitates enhanced thoracic particle deposition

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Nebulised therapy for pulmonary disease has been applied for a long time. However, the total particle deposition depends on many factors that are difficult to control and varies between 20 and 95 %. We here report on a new method to facilitate the pressure supported nasal long-term inhalation (NLI).

Our study included 10 patients (f=5, m=5), age range 49 to 75 years, presenting several COPD stages (GOLD I-III). The NLI device generated particle sizes from 1-2 μm . The pressure support was adjusted to 10 mbar.

We examined the efficacy of the method by screening the deposition in nasal and thoracic airways. We used $^{99\text{m}}\text{Tc}$ -nanocoll to identify the activity scintigraphically in various respiratory sections.

We could show that deposition in the lung periphery by using the pressure supported transnasal application will increase significantly compared with conventional methods. The usual method produced an average nasal deposition of 5.9 MBq and a periphery deposition of 9.6 MBq, whereas NLI method results in an average nasal deposition of 4.2 MBq and a periphery deposition of 12.9 MBq, respectively.

Our study showed that it was possible to penetrate even in periphery pulmonary tissue in COPD patients by using the NLI system. In addition, we achieved an enhancement of the thoracic deposition of $^{99\text{m}}\text{Tc}$ -nanocoll, when recorded a reduction of activity in the nasopharyngeal zone. Further clinical trials will be necessary to define appropriate doses of aerosolized drugs, and confirm the clinical relevance.