

Nasal saline as a placebo in a rhinosinusitis study

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Dear editor

I read with interest Mainz et al's article in the February issue of your journal.¹ The authors concluded that sinonasal inhalation of vibrating antibiotic aerosols appears promising for reducing pathogen colonization of paranasal sinuses and for control of symptoms in patients with cystic fibrosis. We have an objection to their study methods.

It is well known that isotonic saline solution nasal washing facilitates nasal drainage and cleans the airway of any postnasal discharge (including allergens); furthermore, it can be effective when applied appropriately.²⁻⁶ Isotonic saline solution is applied (five dropperfuls in each nostril) at least four times a day until the symptomatology subsides.² In addition, isotonic saline solution irrigation has been found to reduce inflammatory mediators (histamine, prostaglandin D₂, and leukotriene C₄) and allergens in nasal secretions.⁷ For these reasons, nasal washing with saline is effective against pathologies of the upper respiratory tract that occur via inflammatory mediators, namely, the common cold, acute and chronic sinusitis, and, in particular, rhinitis.⁷

As a result, nasal saline, administered with the correct technique, can be as effective as nasal drugs; therefore, it cannot be used as a placebo in a rhinosinusitis study.

Disclosure

The author reports no conflicts of interest in this communication.

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Authors' reply

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Dear editor

We agree with Ahmet Karadag's comment that isotonic saline as an adjunct treatment, regularly performed with nasal douches of the upper airways with 250 mL of isotonic saline, can have positive effects on upper airway symptoms.¹ Apart from removing secretions and crusts, this therapeutic nasal lavage can also reduce the nasal load of allergens and pathogens, as well as of inflammatory mediators.

Regarding our present trial, we estimate that approximately 1 mL of isotonic saline or tobramycin solution should have reached the nasal cavity and paranasal sinuses during sinonasal inhalation with the PARI Sinus™ nebulizer (PARI Corp, Starnberg, Germany).² Therefore, the physical effect of cleansing the sinonasal space within our trial should not be overestimated, and we would expect similar effects in both therapeutic arms of our study.

The objection of Karadag regarding the choice of isotonic saline as placebo should be discussed in regard to the primary endpoint of our trial: *Pseudomonas aeruginosa* colony count in diagnostic nasal lavage. We presented the method in a recent publication by our group,³ in which a video was supplied for training issues.

Most interestingly, saline solutions have the potential to reduce bacterial motility, as well as the ability to perform biofilms, and even exhibit a bactericidal potential. This was assessed in a very recent trial by Michon et al,⁴ who studied the in vitro effects of different concentrations of saline on *P. aeruginosa* isolated from the respiratory tract of cystic fibrosis patients. Applying a 10% hypertonic solution, bactericidal activity on 90% of the isolates was found. As visualized in Figure 1, hypertonic saline of lower concentrations also had bactericidal effects. However, isotonic saline was not shown to have different effects on bacterial growth in comparison to distilled water, even if the pathogens' motility appeared to be slightly reduced.⁴

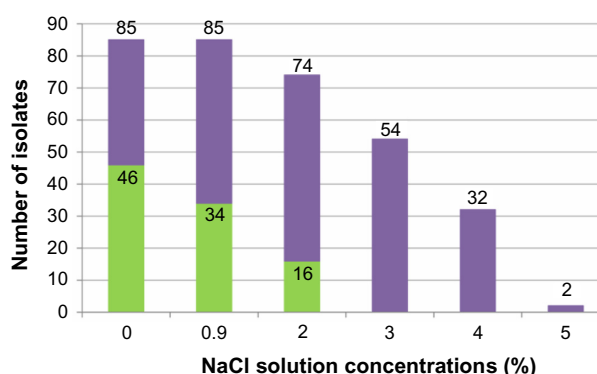


Figure 1 Rate of motile *Pseudomonas aeruginosa* isolates according to NaCl concentration.

Notes: Green bars show the number of motile isolates among isolates with non-inhibited growth (full bars). Reprinted with permission from Michon AL, Jumas-Bilak E, Chiron R, Lamy B, Marchandin H. Advances toward the elucidation of hypertonic saline effects on *Pseudomonas aeruginosa* from cystic fibrosis patients. *PLoS One*. 2014;9(2):e90164.⁴

As the described dose-dependent growth inhibition of saline solutions does not apply to isotonic saline, the use of isotonic saline does not relevantly bias the results of the primary endpoint of our study. Conclusively, isotonic saline is appropriate for use as a placebo when compared to an antibiotic treatment.

In parallel to our publication on pulsating sinonasal inhalation with tobramycin,⁵ we published a trial on sinonasal inhalation of dornase alfa in the *Journal of Cystic Fibrosis* (JCF).² As a control substance for the recombinant mucolytic designed for cystic fibrosis,⁶ we also applied isotonic saline.

Karadag submitted a very similar letter to the editor to JCF, equally objecting to the use of isotonic saline as a placebo. As sinonasal symptoms, which were assessed in the DDDT publication as a secondary outcome parameter, were the primary endpoint in our JCF article, we would like to discuss this issue in our response to Karadag's letter submitted to JCF.⁷

Disclosure

The authors report no conflicts of interest in this communication.

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