Nasal hygiene of children remains a constant concern for ENT specialists and for many patients. The rapid restoration of good nasal patency after a simple rhinitis and its maintenance throughout the year remains the best guarantee of good functioning of the facial sinuses and the tubo-tympanic apparatus. In fact, the harmful role of nasal obstruction and sniffing on sinus pressure and Eustachian tube function has been demonstrated in subjects of all ages (1, 3).

The frequency of glue ear, occasionally responsible for serious complications, reminds us of the importance of good nasal and tubal function in children (2, 4).

The therapeutic problems are particularly important in children under the age of 3 years, who often do not know how to blow their nose. After the age of 3 years, many children still do not know how to blow their nose, either as a result of parental neglect or because of non-treated chronic nasal obstruction.

Apart from allergic manifestations, anatomical malformations and rare diseases of the muco-ciliary apparatus, the treatment of these cases of nasal obstruction in young children is based on rhinopharyngeal disinfection by means of a sterile saline solution, isotonic to the mucosa.

**MATERIAL AND METHODS**

STÉRIMAR is a solution of isotonic sterile sea water packaged under pressure in a small metal bottle.

The nasal nozzle allows gentle spraying of the solution into the nasal fossae. One bottle of STÉRIMAR is sufficient for 250 to 300 sprays of the solution which always remains sterile.

The objective of this study was to compare the advantages of STÉRIMAR with those of classical instillations of physiological saline using a small pipette, a syringe or an irrigation pear.

45 children presenting to the Hospital Robert Debré ENT department were randomly selected to participate in the following therapeutic protocol:

- administration of STÉRIMAR, 3 to 6 times a day into each nasal fossa, for a period of at least 10 days.

Five patients did not return for review and could not be recontacted.
For the other 40 patients, each clinical file includes the evaluation of the efficacy of STÉRIMAR together with the data of the clinical history obtained from the parents, which included assessment of the safety, acceptability and overall efficacy compared with any other methods of rhinopharyngeal disinfection previously used.

At the time of inclusion into the study, these 40 patients were aged between 15 days and 12 years:
- 4 were under the age of 6 months,
- 20 were between the ages of 6 months and 3 years,
- 12 were between the ages of 3 years and 7 years
- and 4 were over the age of 7 years.

There were 20 boys and 20 girls.

These children presented with the following symptoms at the initial consultation prior to starting treatment:
- obstructive rhinitis with clear or purulent rhinorrhea: 27 patients (including one neonate),
- dry rhinitis with crusts and permanent mouth breathing: 8 patients,
- clean nose, consultation for a chronic disease: 5 patients.

The concomitant disease in these children at the time of the first visit was as follows:
- glue ear in 9 cases,
- acute otitis media in 7 cases,
- bronchitis in one case,
- and cystic fibrosis in one case.

The clinical history of these patients was also marked, apart from glue ear in nine cases, by:
- adenoidectomy in 6 cases,
- gastro-oesophageal reflux in 5 cases,
- frank allergic predisposition in 4 cases,
- recurrent bronchitis in one case,
- cholesteatoma in one case,
- craniofacial dysmorphia with considerable narrowing of the middle third of the face in one case.

The previous treatments already administered for rhinopharyngeal disinfection were:
- normal saline in 12 cases,
- PRORHINEL® in 7 cases,
- STÉRIMAR in one case,
- SOFRAMYCINE® nasal in one case.

The treatments co-prescribed with STÉRIMAR in the course of the study protocol were:
- an antibiotic in 9 cases,
- a mucolytic in 4 cases,
- aspirin 3 cases,
- an antihistaminic in 3 cases,
- anti-reflux treatment in 2 cases,
- and a nasal syringe in one neonate.

RESULTS
The results, assessed by questioning the parents and by anterior rhinoscopy, demonstrated 30 unquestionable therapeutic successes distributed in the following way according to the initial diagnosis:

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obstructive rhinitis</td>
<td>Success = 21</td>
</tr>
<tr>
<td>27 including 1 neonate</td>
<td>Failures = 6 (including 1 refusal of a child and 2 pre-existing allergies)</td>
</tr>
<tr>
<td>(clear or purulent rhinorrhea)</td>
<td></td>
</tr>
<tr>
<td>Nasal hygiene: 13 including</td>
<td>Success = 5</td>
</tr>
<tr>
<td>- crusts, mouth breathing : 8</td>
<td>Failures = 3 (allergy, narrowness of the nasal fossae, incorrect use)</td>
</tr>
<tr>
<td>- clean nose : 5</td>
<td>Success = 4</td>
</tr>
<tr>
<td></td>
<td>Failures = 1 (pre-existing allergy)</td>
</tr>
</tbody>
</table>

Questioning of the parents revealed the following elements:
- the safety was considered to be excellent in every case,
- the acceptability was considered to be good by the mother and the child in 21 cases, fairly good in 15 cases (generally corresponding to initial refusal by the infant which was rapidly overcome by means of persuasion by the parents) and poor in 4 cases in which the parents were unable to make the child accept treatment (between the age of 2 and 5 years) and in one case because the mother, who administered the product with the child lying down rather than sitting, rapidly abandoned treatment.
- the overall efficacy of STÉRIMAR was considered by the parents to be very good or excellent in 21 cases, fairly good or moderate in 16 cases and poor in 3 cases (one case of pre-existing allergy, one case of cystic fibrosis and one case of chronic non-allergic rhinitis in a 7½ year old child).
CONCLUSION

The efficacy of STÉRIMAR was considered, by the parents and by the ENT specialist, to be excellent or satisfactory in the great majority of cases in which it was tested.

STÉRIMAR appears to facilitate restoration of nasal permeability in cases of non-allergic rhinitis by accelerating the elimination of secretions and by facilitating nose blowing. In patients of all ages, it especially helped those subjects unable to blow their nose. In cases of crusts inside the nose associated with mouth breathing, STÉRIMAR allowed elimination of the crusts and induced a regular habit of nose blowing, at least three times a day, which allowed restoration of regular nasal breathing. However, no influence on tubo-tympanic function was investigated in this very brief study. However, the experience acquired previously demonstrates that restoration of nasal breathing is an essential prerequisite to the return of normal function of the Eustachian tube (4).

In these cases and in cases considered to be normal on the initial examination, STÉRIMAR appeared to allow the development of gentle, easy and physiological nasal hygiene.

The limitations of use of STÉRIMAR appear to be related to the clinical context congenital mucociliary diseases, malformations with stenosis of the nasal fossae, naso-sinus allergy requiring antihistamine treatment and the child's behaviour preventing the introduction of any treatment into the nose.

Without being a drug treatment, STÉRIMAR therefore exerts a definite efficacy on :
- cleansing of the nasal fossae,
- education of nose blowing,
- and daily nasal hygiene in children.

Its ease of use and its safety (due to the small amount delivered in each spray and the sterility of the contents) were generally considered by the users to be superior to the classical physiological saline solutions generally prescribed. This was demonstrated in almost all of the cases in our study, which does not however have any statistical significance.

STÉRIMAR has its place amongst the available treatments in paediatric rhinology.

REFERENCES
