Rhinology, 25, 259-264, 1987

The usefulness of irrigation of the maxillary sinus in children with maxillary sinusitis on the basis of the Water's X-ray

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SUMMARY

The authors studied 80 children with sinusitis, all treated with amoxycillin and a decongestive preparation. The authors reached the conclusion that in 30 out of 80 children the third standard X-ray becomes normal without further treatment. In the remaining 50 children the usefulness of irrigation of the maxillary sinus was studied: one group was treated with antroscopy and sinuscopy while the second group did not receive this treatment (control). In both groups control X-rays were performed after three weeks. There was no significant difference between the two groups, which indicates that irrigation does not lead to a better cure.

A correlation of 71% was found between X-ray findings and antroscopic findings. As a first treatment antibiotics are recommended.

INTRODUCTION

Criteria for diagnosis and treatment of maxillary sinusitis in children have as yet not been agreed upon (Wald and Bluestone, 1981).

The aim of this study is to evaluate and compare treatment of rhinosinusitis in children with antibiotics alone, or with antibiotics and decongestion combined with antroscopy and irrigation.

METHOD

Eighty children aged between 2 and 9 were admitted to the study. All children were examined by a otorhinolaryngologist of the University Hospital of Brussels. A nasal culture was made and standard X-rays of the sinuses were taken in order to confirm the diagnosis of rhinosinusitis. Patients were given a medical treatment for sinusitis consisting of amoxycillin 50 mg/kg/d and a preparation for nasal decongestion: xylometazolin 0,05% or oxymetazolin 0,025%. Medical treatment was continued for ten days and control X-ray of the sinus was carried

Paper presented at the 11th Congress of the European Rhinologic Society and 5th ISIAN, Athens (Greece), June 1986.

out within a week. If the Water's control X-ray did not show a clear improvement, the child was included in the study.

Eighty children were included in the study. Four X-rays were made for each child. The first X-ray was taken during the first consultation, the second X-ray was made after medical treatment.

The third X-ray was made before the operation, all children had undergone a surgical intervention (adenotomy, adenotonsillectomy, ventilation tubes). The fourth X-ray was taken as a control examination three weeks after the operation. 30 of the 80 children had te be assigned to group "A". These were children who had a pathological second X-ray and in whom an antroscopy might be carried out. To our surprise we found that in 30 of the 80 children (37%) the preoperative X-ray had normalized (third).

Between the second and the third X-ray was a lapse of three to five weeks (average: 26 days). In the remaining 50 children the third preoperative X-ray was pathological. In 25 randomly selected children (group B) an antroscopy with irrigation was carried out. In the other 25 children (group C) no antroscopy was performed.

In all of the 50 children a postoperative control X-ray (fourth) was performed. There was a lapse of 11 to 28 days between the operation and the fourth X-ray. The average lapse was 21 days. During the antroscopic procedure a specimen was taken for culture, irrigation and sinuscopy were performed and a drain was left in place when there was found pus.

The standard Water's X-ray were assessed as follows:

type 0 : normal
type 1 : oedema, thickness of mucosa less than 6 mm
type 2 : oedema, thickness of mucosa greater than 6 mm very small lumen
type 3 : completely shaded

The sinuscopy was assessed as follows:

type 0 : impossible
type I : normal mucosa seen
type II : slightly pathological, hyperplasia or local polyps or cysts
type III: very pathological, sinus filled with polyps or cysts and/or presence of pus

The mean age of the children was between 3 and 6 years (81%).

The symptoms and clinical findings were as follows:

most children coughed in the evening, during the night or when lying down (67%); they had a blocked or runny nose in 83% and ear complaints in 50%. Clinical examination showed post-nasal drip in 60% of the cases and purulent secretions in the meatus medius in 50%.

RESULTS

1. Evolution between the second and the third X-ray (group A)

Table 1 shows the evolution between the second and the third preoperative X-ray without concomittant treatment. For the sake of simplicity, findings have been recorded for each of the 160 sinuses. Hence, 60 type 0 sinuses (16 and 26 and 18) normalized after a first conservative treatment.

Table 1. Radiological evolution without further treatment.

second X-ray		third X-ray		
85 X-ray	type 3	51	type 3 unchanged	
		34	type 2, 1, 0 improved	40%
50 X-ray	type 2	16	type 2 or 3 worse or unchanged	
		34	type 1 or 0 improved	68%
25 X-ray	type 1	7	type 1 or 2 worse or unchanged	
		18	type 0 (normal) improved	72%

2. Comparison of therapeutic results in group "B" and group "C"

Fifty children (100 sinuses) were available for further follow-up. They all had third Water's X-ray that remained pathological (taken the day before the operation). Selection was at random on the day of the operation: antroscopy for the first child, no antroscopy for the second child, antroscopy for the third child, etc. A group B (25 children with sinuscopy) and a control group C (25 children without sinuscopy) were thus constituted. The results are seen in Table 2. There is no better result in the group with irrigation (group B) which means that irrigation is only advised in selected cases (see discussion).

Table 2. Comparison (treatment with or without irrigation) on X-ray improvement.

groep B sinuscopy + irrigation				groep C without irrigation			
	number	improved or cured	%		number	improved or cured	%
type 3	30	21	70	type 3	21	16	76
type 2	11	6	55	type 2	15	10	66
type 1	4	2	50	type 1	13	8	62

3. Comparative results of X-rays and sinuscopy findings

In group B the X-ray findings (type 1, 2, 3) were compared with the sinuscopy findings (type I, II, III). They were 45 antroscopic examinations performed on the 25

children in group B. They were 25 X-rays taken and these were assessed 50 times (the X-ray was taken the day before the sinuscopy (Table 3).
There was the following agreement for each type 70%, 69%, 75%; with an average of 71% between X-ray and sinuscopy.

Table 3. Comparative results between X-ray and sinuscopy.

X-ray findings			sinuscopy findings		
	number	%	number		%
type 3	30	100	21	type III	70
			7	type II	
			2	type I	
			1	type III	69
type 2	11	100	7	type II	
			3	type I	
			1	type II	
type 1	4	100	3	type I	75

DISCUSSION

Assessment of the evolution of sinusitis was based on X-rays. Although some discussion is still going on regarding the importance of X-ray and clinical findings (Caffey, 1978), an increasing number of studies show that history and clinical findings are more reliable than a standard X-ray (Rachelefsky, 1973; 1978). He has also shown that treatment with antibiotics leads to the disappearance of the complaints and pathological X-ray findings. However, when the radiological evolution is considered, it seems that the more passage of time without any further treatment (group A) also leads to the disappearance of the pathological X-ray findings. This was observed in 30 out of 80 children (37%). According to Jannert (1982) it takes at least a month before all mucosal swellings on a control X-ray have disappeared. Axellson (1970) reaches the same conclusion.
When we consider the X-ray type 3, we find very little difference between the antroscopy group "B" and the control group "C". For type 2 there was only 11% difference between group B and C (respectively 55% and 66%). This means that in spite of the irrigation (if pus is present) no better result is to be expected with respect to the control group when we compared the X-rays. The usefulness of a daily irrigation of the maxillary sinus is therefore not confirmed by the present study since the results are at least as good as in the control group. A waiting attitude seems to be equally effective. Most authors have tried to illustrate the usefulness of a sinus puncture. We do, however, support the view that a long-term

antibiotic course is more appropriate. An explanation for the slight difference between group B and C may be found in the value of the standard X-ray. Caffey (1978) has always maintained that a standard X-ray does not really represent the actual condition. He showed that a crying child can have shaded sinuses on the X-ray, although there is obviously no infection in these cases. Diagnosis is usually based on a standard X-ray, which appears to be a relatively reliable method of visualizing the maxillary sinus (Clement, 1980). X-rays may show that a sinus pathology exists but they are unable to show the difference between a swelling of the mucosa and the presence of secretions (Van de Eeckhout, 1978). This is possible with an antroscopy (Terrier, 1978; Behncke, 1980; Jazbi, 1979; Decreton, 1980). In the literature we found very few studies comparing antroscopy with X-ray of the maxillary sinus in children. Bencke (1980): little agreement, Decreton (1980): 66% agreement, Daele (1984): agreement, Maes (1986): 71% agreement. From this study it appears that antroscopy is the only method to examine the internal condition of the sinus. Furthermore, it offers bacteriological, histological and therapeutical possibilities. An inconvenience is that antroscopy must be performed under general anaesthesia. In children a radiological examination remains the best indirect, non invasive method of obtaining information on the condition of the sinus.

RÉSUMÉ

Les auteurs étudient 80 enfants souffrant de sinusite. Un traitement avec des antibiotiques a été donné. Les auteurs constatent que 30 des enfants avaient une troisième radiographie normale (groupe A). Les 50 autres enfants ont été divisé en deux groupes: un groupe avec antroscopie (groupe B) et une groupe C sans antroscopie, suivi par une radiographie trois semaines après. Il n'y a pas de différence significative entre les deux groupes B et C: ce qui veut dire que l'irrigation ne donne pas un meilleur résultat. Une corrélation de 71% a été trouvée entre les radiographies et la sinuscopie.

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