

DOES ANTIBACTERIAL THERAPY EFFECT THE RECOVERY FROM MAXILLARY SINUSITIS?

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In a recent paper I reported my experience of the effect of antibiotics on acute or subacute maxillary sinusitis (Kortekangas 1963). When the numbers of antral irrigations required before recovery in patients who received effective, ineffective or no antibiotics following the diagnostic antral puncture were counted, the antibiotic treatment had only a very limited effect on the duration of sinusitis. The aim of this work was determine the value of antibiotics in connection with irrigations.

Material and methods. The series comprised patients from a private practice. All suitable patients from the earlier series (Kortekangas 1963) and a number of recent patients were included. As their clinical classification does not significantly differ from that of the earlier published material, it is not given in detail. In the additional series local instillations of antibiotics were only exceptionally used and as a rule, parenteral or oral administration of antibiotics was begun only after the results of cultivation of the first antral secretions, including sensitivity tests, were known. The antibiotics used were penicillin (penicillin V *per os* and penicillin G parenterally), chloramphenicol and tetracycline in decreasing order of frequency. Occasional patients received erythromycin or ampicillin. All the patients are discussed together as there were no essential differences in spite of the fact that the choice of antibiotic in the recent patients was determined by the results of the cultivation of the secretions. Patients that required operative treatment were excluded.

The antibacterial treatment generally lasted one week. When no definite effect resulted, the same drug was often continued for another four to seven days. The antibacterial treatment was considered effective if recovery followed within a week of its onset. If recovery followed within the second week, it was taken to indicate a possible effect of the antibiotic.

A control series was provided by the patients who received the same treatment, irrigations and decongestive drugs, but no antibiotics. A second control series comprised patients who received antibiotics that were ineffective against the bacteria found in their antral secretions.

The method of taking samples has been described earlier (Kortekangas 1963). Conventional bacteriological methods were used.

Results. Table 1 shows the results for the whole series. The relative numbers of sinuses that recovered within the first week and within the first two weeks after the diagnostic puncture do not differ significantly in three groups.

	RECOVERY			Total number
	Within the first week	Within the second week	Later	
Respiratory pathogens present in secretions	103 38.6 %	91 34.2 %	73 27.2 %	267
Only apathogens present in secretions	32 36.0 %	28 31.5 %	29 32.5 %	89
No bacteria present in secretions	24 29.7 %	30 37.1 %	27 33.2 %	81
Total	159	149	129	437

Table 1. Time of recovery after diagnostic antral puncture in the series grouped according to the results of bacteriological examinations. The figures give the number of sinuses.

	RECOVERY			Total number
	Within the first week	Within the second week	Later	
The whole flora sensitive to the employed antibiotic	14 37 %	11 29 %	13 34 %	38
One or more species in the flora resistant to the employed antibiotic	11 42 %	8 31 %	7 27 %	26
No systematic antibacterial treatment given	7 28 %	9 36 %	9 36 %	25
Total	32	28	29	89

Table 3. Response to various treatments of sinuses from which only apathogens were isolated.

	RECOVERY			Total number
	Within the first week	Within the second week	Later	
Pathogen(s) sensitive to the employed antibiotic	68 40 %	58 34 %	45 26 %	171
Pathogen resistant to the employed antibiotic	14 39 %	15 42 %	7 19 %	36
No systematic antibacterial treatment given	21 35 %	18 30 %	21 35 %	60
Total	103	91	73	267

Table 2. Response to various treatments of sinuses in which respiratory pathogens (*Streptococcus pyogenes*, *Diplococcus pneumoniae*, *Haemophilus influenzae*, *Klebsiella pneumoniae*) were found.

	RECOVERY			Total number
	Within the first week	Within the second week	Later	
Antibiotics given	13 29 %	13 29 %	19 42 %	45
No antibiotics given	11 31 %	17 47 %	8 22 %	36
Total	24	30	27	81

Recovery was higher in two weeks for the sinuses of patients who did not receive antibacterial therapy. Chi-square for the difference = 3.60; $0.05 > P > 0.02$.

Table 4. Response to various treatments of sinuses yielding no bacteria.

Each group is separately analysed in Tables 2, 3 and 4. Table 2 contains the combined results for all sinuses containing pathogens. The results for each bacterium are not given separately as no statistically significant differences were established in the proportion of recovered sinuses. The only statistically significant difference was found for the sterile sinuses. (Table 4). Antibacterial treatment seemed to lead to a lower proportion of rapid recoveries than no systematic antibacterial treatment.

PREVALENT BACTERIUM IN SECRETION	NUMBER OF SINUSES THAT RECOVERED												Total number
	Within the first week				Within the second week				Later				
	N	R	M	S	N	R	M	S	N	R	M	S	
Diplococcus pneumoniae	9	—	—	7	5	—	—	6	2	—	—	8	37
Streptococcus pyogenes	—	—	—	—	—	—	—	—	1	—	—	1	2
Haemophilus influenzae	2	10	6	1	4	5	12	1	2	7	5	2	57
Apathogen(s) only	3	3	2	1	4	3	1	2	4	4	2	2	31
Staphylococcus aureus	2	2	3	2	—	3	2	2	2	1	1	—	20
Sterile secretions	6	—	—	5	9	—	—	8	4	—	—	4	36
Total	22	15	11	16	22	11	15	19	15	12	8	17	183

- N = No local instillation of antibiotics after irrigation
R = Prevalent bacterium resistant to the locally instilled antibiotic
M = Prevalent bacterium moderately sensitive to the locally instilled antibiotic
S = Prevalent bacterium highly sensitive to the locally instilled antibiotic

Table 5. The effect of antibiotics instilled into maxillary sinuses after puncture and irrigation.

Table 5 relates to sinuses of patients who did not receive systematic antibacterial treatment and the sinuses in which the main bacterium (pathogen when present) was resistant to the antibiotic employed. This table reveals the effect of instillations of antibiotics into the sinus. As the concentration in the cavity was very high, also partial resistance has been taken into account separately. The table shows there were no statistically significant differences in response between the sinuses that were instilled with antibiotics to which the bacteria were resistant, moderately sensitive or highly sensitive and the sinuses into which no antibacterial instillations were made. The respiratory pathogens are given separately and **Staphylococcus aureus** is separated from the group of apathogens.

Discussion. The general result of my earlier study was that antibacterial treatment following diagnostic sinus puncture did not significantly shorten the duration of sinusitis. However, a significantly greater number of rapid recoveries occurred when **Haemophilus influenzae** was present in sinus secretions. The present study on the effect of antibiotics on sinus recovery did not verify this finding. This is due to the fact that the recent patients included several with markedly obstinate sinusitis associated with **Haemophilus influenzae**. The bacteriological examinations of the recent series show that **Staphylococcus aureus** seldom is associated with maxillary sinusitis. This supports

the views on its lesser importance as a respiratory pathogen, although in the present author's opinion its significance cannot be completely denied.

The prevailing opinion on the futility of local instillations of antibiotics into maxillary sinuses are supported by the results of this study.

It was a surprise to the present author that no statistically significant results of antibacterial treatment were revealed. The lack of any difference in favour of antibiotic therapy is further stressed by the fact that antibacterial treatment was begun in a number of cases, especially among the most recent patients, only after some time had elapsed from the diagnostic puncture. This delay should have led to a higher incidence of rapid recoveries owing to the well-known spontaneous tendency of sinuses to recover. In my opinion this shows that the effect of antibiotics is much smaller than the effect of procedures which aim to restore the normal function of the sinus. How objectionable sinus puncture and irrigation may be, it certainly is one of the most effective procedures for restoring sinus function. This kind of investigation unfortunately cannot compare antibacterial therapy and spontaneous recovery without minor surgical procedures.

SUMMARY

437 acute or subacute maxillary sinus infections were studied. 316 sinuses were those of patients who received antibacterial treatment. The bacteria found in the antral secretions of 62 of these were resistant to the antibiotic used. 121 sinuses were those of patients who did not receive antibacterial treatment. The antibacterial treatment was considered effective if recovery followed within a week of the onset of the antibiotic course and probably effective if recovery followed within the second week. No significant effect of the antibiotic therapy was revealed by the proportion of recoveries in patients who did and did not receive antibiotics in connection with punctures and irrigations.

RÉSUMÉ

437 cas d'infections aiguës ou subaiguës des sinus maxillaires ont été étudiés.

316 cas ont reçu un traitement antibiotique. Les germes observés dans les sécrétions de 62 d'entre eux étaient résistants aux antibiotiques utilisés. 121 cas n'ont reçu aucune antibiothérapie.

Le traitement a été considéré comme efficace lorsque la guérison a été obtenue dans la semaine qui a suivi le commencement du traitement et comme d'efficacité probable lorsque l'amélioration est survenue dans la deuxième semaine.

Aucun effet significatif de l'antibiothérapie n'a été relevé chez les patients guéris qui ont reçu ou non en même temps que l'antibiothérapie des ponctions de sinus avec irrigation.

REFERENCES

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