Respiratory tract infections in Greenland: results of an audit project

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ABSTRACT

Objectives. To elucidate and improve quality of diagnosis and treatment of respiratory tract infections in Greenland. Study design. All district medical officers and nursing staff in the Greenlandic coastal health services were invited to participate in the study. Twenty-five district medical officers and the nursing staff from nine districts completed the project and registered in a 3-week period 1,163 contacts involving respiratory tract infections. Methods. Self-registration according to the Audit Project Odense (APO) method on a simple APO registration chart. All contacts involving respiratory tract infections were registered with regard to sex, type of contact, contact form, infection focus, diagnosis and treatment, origin of infection, antibiotic treatment, choice of antibiotics and possible sick-leave. Results. Of the 1,163 registered contacts lung infections represented 26%, throat infections 22% and otitis media 16%. Paraclinical tests were performed in 32% of the cases, 47% of the cases were treated with antibiotics, in 2/3 of the cases with penicillin V. The use of paraclinical tests was somewhat lower and the use of antibiotics was higher than in Denmark. Conclusion. The study showed that it is possible to carry out an APO audit in Greenland, and that there was a moderate difference in the diagnosis and treatment between Greenland and Denmark. An increased use of paraclinical tests may result in quality improvement.

Key words: Greenland, respiratory tract infections, audit, general practice, antibiotics

INTRODUCTION

Respiratory tract infections in general and otitis media in particular are more frequent among Greenlandic children than among Danish children. A prospective cohort study of children ≤ 2 years in Sisimiut showed that respiratory tract infections in this group occurred 1.2 to 3.8 times more frequently than in similar studies from other countries (1,2). A Danish doctoral thesis from 2001 (3) showed that 40% of the children in Nuuk and Sisimiut developed acute otitis media (AOM) in their first year of life, and that the relative risk of recurrent AOM was eight times greater if the first episode occurred within the first six months of life. In a study from 1996 (4) a very high prevalence of potentially pathogenic bacteria in the nasopharyngeal secretion was found, especially pneumococci, non-b H. Influenzae and haemolytic streptococci, in children with AOM (98%), but also in a control group of similar-aged children (91%). Pneumococci were the only bacteria that were significantly more frequently found in the nasopharynx in AOM children compared with the children in the control group.

For more than 10 years Audit Project Odense (APO) has carried out yearly audits on respiratory tract infections in general practice in Denmark. Several important intervention results have been achieved (5,6), and audit has probably contributed to the fact that the frequency of antibiotic prescribing among Danish GPs is one of the lowest in the world. Based on the 2002 sales figures, an-
Antibiotic consumption is considerably higher (approx. 27 DDD/1,000 inhabitants/day; Danish Medicines Agency) in Greenland than in Denmark (approx. 15 DDD/1,000 inhabitants/day; personal communication Directorate for Health, Nuuk).

An audit on respiratory tract infections among a patient population in Greenland would thus be highly relevant. An approach from Greenland’s Rural Health Management to APO resulted in an audit in the autumn of 2002 being offered to Greenland’s district medical officers and the nursing staff in the municipalities. This report is a summary of the results achieved in this study previously described in Danish (7).

**STUDY DESIGN**

In October 2002, all medical officers and nursing staff in the sixteen health districts were invited to participate in an audit, and interest in participation was high. The registration material including a comprehensive guideline was sent from APO to the participants at the end of November 2002. The participants started the registration at the beginning of December 2002, and everybody had to register for 15 whole working days where they saw patients with respiratory tract infections.

As a number of doctors had many days off from the outpatient clinic, the registration carried on into 2003 for several participants. The nursing staff in the individual districts did the registration jointly. On a simple APO registration chart, used for similar registrations in Denmark, all respiratory tract infections had to be registered with regard to sex, type of contact, contact form, infection focus, diagnosis and treatment, origin of infection, antibiotic treatment, choice of antibiotics and possible sick-leave (Figure 1).

![Figure 1. Chart for registration of diagnosis and treatment of respiratory tract infections (Audit Project Odense).](image-url)
RESULTS

Table I. Prevalence of the various respiratory tract infections seen by the doctors and the nursing staff.

| Infection focus     | Seen by doctor (%) | Seen by nursing staff (%) |
|---------------------|--------------------|---------------------------|
| Ears                | 118 (14.3)         | 68 (20.2)                 |
| Tonsils             | 120 (14.5)         | 138 (40.9)                |
| Pharynx/larynx      | 66 (8.0)           | 24 (7.1)                  |
| Sinuses             | 96 (11.6)          | 21 (6.2)                  |
| Bronchi             | 67 (8.1)           | 8 (2.4)                   |
| Lungs               | 258 (31.2)         | 44 (13.1)                 |
| Diffuse localisation| 80 (9.7)           | 10 (3.0)                  |
| Several localisations| 20 (2.4)    | 17 (5.0)                  |
| Unknown             | 1 (0.1)            | 7 (2.1)                   |

Total number of contacts: 826 (100) 337 (100)

Overall results

Twenty-five district medical officers and nursing staff from nine districts completed the study and registered 826 and 337 cases, respectively – a total of 1,163 contacts involving respiratory tract infections (Table I). Lung infections represented 26%, throat infections 22% and otitis media 16% of the registered cases.

Paraclinical test was carried out in approx. 32% cases - most frequently by the nursing staff, who also had relatively more tonsillitis cases than the doctors. The infections were assessed as viral in 54% of the registered cases – in a similar study in Denmark the figure was 65%. In agreement with this, 53% of the cases were not treated with antibiotics – in Denmark 65%.

For those who received treatment, penicillin V was used in 64% of the cases, broad-spectrum penicillin in 20%, macrolides in 8%, tetracycline in 2% and other antibiotics in 6% of the cases. Compared with the latest Danish study comprising 17,954 contacts (8) the consumption of broad-spectrum penicillins is nearly twice as high in Greenland, whereas the macrolide consumption is only half of the consumption in Denmark. Individual variations in the origin of the infections mean, however, that this result should be interpreted with some caution.

Otitis media

16% of the contacts (14.4% of the doctors’ and 20.2% of the nursing staff’s contacts) involved ear infections. This frequency is somewhat higher than in similar studies in Danish general practice, where the frequency is around 10%. This reflects the previously described higher prevalence of otitis in the Greenlandic child population. In 44% of the cases antibiotic treatment was not considered indicated. The treatment frequency among doctors and nursing staff was essentially identical, but the doctors prescribed more often broad-spectrum penicillin than the nursing staff, who prescribed penicillin V in more than 2/3 of the treated cases. Just over 5% were prescribed macrolides for treatment of otitis, which is more than twice as many as in the latest Danish study (8).

Use of Strep A

Strep A test was used for diagnosis in 73% of the tonsillitis cases, which is somewhat lower than in similar studies among Danish doctors, where the frequency in the use of Strep A in recent years has been around 85% of cases. Strep A was used more frequently by the nurses (84% of the cases) than by the doctors (62%). Figure 2 shows the

Figure 2. Diagram of variation in the use of Strep A test for diagnosis of tonsillitis.
participant variation in the use of Strep A for diagnosis of tonsillitis. The figure is based on the total result for the doctors and nursing staff, who have registered cases of tonsillitis, 29 participants in total. As can be seen, there is a wide variation between them, as more than 20% of the participants did not use Strep A at all in the diagnosis and treatment of acute tonsillitis.

In the cases where Strep A was used, the finding was to a large extent acted upon (see Figure 3). In 69% of the cases where the diagnosis was based on clinical examination alone, antibiotics were prescribed, which from previous studies has proved to be an unnecessary over-consumption (9). In the majority of cases, where antibiotic treatment was given, penicillin V was chosen.

Use of CRP rapid test
CRP rapid test was used in 4% of all cases – in case of sinusitis by the doctors in 6% of the cases, at focus in lungs in 7% both by doctors and nursing staff. In a simultaneous audit in Denmark CRP rapid test was used in 33% and 23% of the cases with sinus and lung foci, respectively. The Danish study indicates a clear antibiotic-reducing effect of CRP rapid test in case of sinusitis, but not in case of lung foci. It is important to emphasize CRP rapid test’s poor sensitivity as well as specificity as a diagnostic tool in case of respiratory tract infections, but CRP rapid test may be able to support the doctors in a more restrictive antibiotic policy. It is, however, thought-provoking that Norwegian doctors, using CRP test in more than 40% of all respiratory infections, have a higher antibiotic consumption than Danish doctors, who use CRP rapid test in 14% of all contacts (8).

DISCUSSION AND CONCLUSION
The study showed that it was possible to carry out an audit according to the APO method in Greenland based on just a brief written instruction, and that it was possible to carry out the registration both among doctors and nursing staff. Based on the relatively high participation rate, the results are considered to be in good agreement with the actual circumstances in Greenland. The selection bias, which must be assumed to be present in many Danish studies (10), is probably smaller in the present study due to the high participation rate.

The relatively high prescribing frequency of antibiotics, 47% compared to 37% in Denmark, may reflect a cultural factor, but also the fact that more and more serious ear infections are found in Greenlandic children may be of importance. The possibility of an early revisit can in several places be very limited, and the increased prevalence of tuberculosis probably makes the doctors more inclined to act. In the most isolated districts one could imagine that the threshold for treatment is low. Both doctors and nursing staff are, however, more consistent in their management of patients with tonsillitis, as in almost 100% of the cases they follow the Strep A result when this test has been carried out. There is, however, important scope for quality development, as 25% of patients with

![Figure 3. Choice of antibiotics in relation to use of Strep A test for diagnosis and treatment of acute tonsillitis.](image-url)
tonsillitis do not have the test done. An introduction of CRP rapid test in the case of sinus and lung foci may also be expected to result in a reduction of antibiotics use.

The most important result of the audit is perhaps that it has become the catalyst for a much-needed professional discussion on the basis of actual observed behaviour. This discussion will continue in the districts, and we are looking forward to repeating the study in 2-3 years.

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