Management of Rhinosinusitis in Children

Consensus Meeting, Brussels, Belgium, September 13, 1996

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Objectives: To (1) provide definitions for the different forms of pediatric rhinosinusitis, with an enumeration of the main symptoms and signs; (2) provide indications for microbiological, allergic, and immunologic assessment as well as for imaging studies; (3) suggest standard medical management with judicious use of antimicrobial agents; and (4) discuss indications for surgery.

Data Sources: Clinical studies and literature data relevant to the different topics of pediatric rhinosinusitis.

Conclusions: Rhinosinusitis in children is a multifactorial disease in which the importance of several predisposing factors changes with increasing age. Continued study to obtain a better understanding of the disease and carefully controlled comparative evaluations of medical and surgical therapies are suggested.

The management of rhinosinusitis in children is a controversial and rapidly evolving issue. Opinions regarding treatment vary from no therapy to extensive sphenoethmoidectomy. Those who favor minimal or no intervention argue that spontaneous resolution of chronic rhinosinusitis in the young child is the norm. At the opposite end of the therapeutic spectrum, surgeons are abandoning the more aggressive surgical techniques in favor of a concept of minimally invasive sinus surgery. Even the use of antibiotics, still the mainstay in the medical management of rhinosinusitis, has to be questioned. The combination of emerging antibiotic resistance of the microorganisms commonly involved in rhinosinusitis plus the infrequency of complications in children treated without antibiotics has prompted some authors to encourage limiting antibiotic therapy to highly selected patients.

With these and other controversies in mind, the members of the Consensus Panel discussed the following topics of rhinosinusitis: definitions, symptoms and signs, diagnosis, medical management, and surgery.

DEFINITIONS

The members of the Consensus Panel prefer to speak of rhinosinusitis since rhinitis and sinusitis in children are often a continuum of disease. Also, it is not possible to differentiate rhinitis from sinusitis on clinical grounds alone. Be aware, however, that isolated rhinitis (ie, allergic or specific) does exist. Isolated sinusitis can also occur but is rare.

The participants of the Consensus Panel have tried to maintain the definitions of sinusitis that evolved from the International Conference on Sinus Disease held in Princeton, NJ, in July 1993. According to these definitions, a computed tomographic (CT) scan is required for the diagnosis of chronic sinusitis. The members of the Consensus Panel believe, however, that CT scanning in all children with suspected chronic rhinosinusitis is not feasible and therefore suggests the following definitions:

1. Acute rhinosinusitis is a sinus infection in which complete resolution of symptoms (judged on a clinical basis only) without intermittent upper respiratory tract infection may take up to 12 weeks. Acute rhinosinusitis is subdivided into severe and nonsevere forms (see “Symptoms and Signs”).

2. Chronic rhinosinusitis is defined as a sinus infection with low-grade symptoms and signs that persist for longer than 12 weeks.
The members of the Consensus Panel note that (1) medical treatment (such as with antibiotics and nasal steroids) may modify symptoms and signs of acute and chronic rhinosinusitis and (2) it is sometimes difficult to differentiate infectious rhinosinusitis from allergic rhinitis on clinical grounds alone.

3. Recurrent acute rhinosinusitis consists of multiple acute episodes in which symptoms and signs resolve completely between episodes. In contrast, in patients with acute exacerbations of chronic rhinosinusitis, symptoms and signs do not resolve completely between episodes (Figure).

SYMPTOMS AND SIGNS

The symptoms and signs of acute rhinosinusitis can be divided into nonsevere and severe forms (Table 1). The symptoms and signs of chronic rhinosinusitis are the same as those of nonsevere acute rhinosinusitis; however, duration exceeds 12 weeks (see “Definitions”); also, fetor oris is a common complaint of parents and caretakers.

DIAGNOSIS

The diagnosis of acute and chronic rhinosinusitis in children is usually made on clinical grounds alone. In selected patients, imaging of the sinuses may be indicated, or it may be necessary to obtain a specimen of sinus secretions for microbiological assessment.

Microbiology

Microbiological assessment is usually not necessary in children with uncomplicated acute or chronic rhinosinusitis. Indications for sinus puncture are (1) a severe illness or a toxic condition in a child, (2) acute illness in a child that does not improve with medical therapy in 48 to 72 hours, (3) an immunocompromised host, and (4) the presence of suppurative (intraorbital or intracranial) complications (orbital cellulitis excepted).

There was no consensus regarding whether middle meatal cultures can substitute for sinus punctures. Culture specimens obtained from the middle meatus or from the ethmoidal bulla are more often likely to show positive results than are culture specimens obtained from the maxillary antrum.

Imaging

Imaging is not necessary to confirm a diagnosis of rhinosinusitis in children. Transillumination of the sinuses is difficult to perform and unreliable in children. The value of ultrasound is controversial. Plain radiographs (only for assessment of maxillary or frontal sinuses) are an alternative if CT scans are not available. A CT scan is indicated if sinus surgery is considered. The other indications for CT scan are identical to those for sinus puncture (see “Microbiology”).

Additional Investigations

In the presence of recalcitrant rhinosinusitis, underlying conditions such as allergy, immunodeficiency, cystic fibrosis, ciliary immotility disorders, and gastroesophageal reflux have to be considered.

Of these, respiratory allergy is perhaps the most frequent. Therefore, in children with chronic or recurrent acute rhinosinusitis with a suggestive history and/or physical examination findings (Table 2), allergic assessment (skin prick testing, nasal smear, radioallergosorbent testing, or trial of treatment) should be performed for patients who continue to have clinical difficulties despite avoidance and simple pharmacological measures. Also, immunologic assessment (complete...
blood cell count, quantitative immunoglobulin levels, immunoglobulin G subclass levels in serum, and antipneumococccic antibody titers) is advised.5,20

MEDICAL MANAGEMENT

Antimicrobial Therapy

Acute Rhinosinusitis. According to the members of the Consensus Panel, indications for antimicrobial therapy are (1) a severe illness or a toxic condition in a child with suspected or proven suppurative complications (parenteral antibiotics are preferred), (2) severe acute rhinosinusitis, and (3) nonsevere acute rhinosinusitis in a child with protracted symptoms to whom antibiotics can be given on an individualized basis (presence of asthma, chronic bronchitis, acute otitis media, etc.).

Regarding the duration of antimicrobial therapy,1,8,30 the Consensus Panel suggests at least 10 to 14 days of treatment for acute rhinosinusitis. Treatment can be prolonged to 1 month if the symptoms have improved but have not resolved completely. However, if symptoms are unchanged at 72 hours or worsen at any time, reevaluation is necessary; the clinician should either change antibiotics or obtain a specimen of sinus secretions for culture.

Chronic Rhinosinusitis. For chronic rhinosinusitis—especially with frequent exacerbations—an initial course of 2 weeks of oral antimicrobial treatment is advised. If there is no response within 5 to 7 days, the antibiotic should be changed. If there is again no response within 5 to 7 days, a specimen of sinus secretions should be obtained for culture or a noninfectious condition should be considered (see “Additional Investigations”). If, however, the patient responds rather slowly, a second 2-week course can be prescribed. In rare cases with clearcut improvement but persisting symptoms, a third course can be given before surgery is considered. Parenteral antimicrobial therapy may be appropriate if oral antimicrobial therapy is ineffective.

For the empiric choice of antibiotics,1,8,14,31-33 refer to Table 3. The following antibiotics are not recom-

Table 3. Recommended Antimicrobial Management

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Additional Medical Therapy

Several members of the Consensus Panel recommend treatment with intranasal steroids50 for children with chronic, nonpurulent rhinosinusitis, especially those with an established diagnosis or a strong suspicion of allergic (specific) rhinitis.

SURGERY

Adenoidectomy

The effect of adenoidectomy on chronic rhinosinusitis has been shown to be effective in some patients in at least 2 clinical trials,36,37 but since these trials were limited in size, definite conclusions cannot be drawn. Adenoidectomy is recommended by some members of the Consensus Panel in the presence of moderate-to-severe nasal obstruction secondary to adenoid hyperplasia.38

Antral Lavage

Antral aspiration and lavage requires general anesthesia in children and is indicated in the presence of a severe, unresponsive, or complicated condition. The indications for antral lavage are the same as those for sinus puncture (see “Microbiology”). According to the literature, antral lavage seems to be ineffective for chronic rhinosinusitis in the younger child.31,39,40

Endoscopic Sinus Surgery

Extensive sphenoidotomy is usually not necessary in children. Anterior ethmoidectomy (with removal of the uncinate process with or without maxillary antrostomy, opening of the bulla, no dissection posterior to the basal lamella) is often sufficient.3,4,17,25,30

The members of the Consensus Panel prefer to divide indications for sinus surgery into absolute and possible indications.

Absolute indications are as follows: (1) complete nasal obstruction in cystic fibrosis due to massive polyposis or closure of the nose by medialization of the lateral nasal wall; (2) antrochoanal polyp; (3) intracranial complications; (4) mucoceles and mucopyoceles; (5) orbital abscess; (6) traumatic injury in the optic canal (decompression); (7) dacryocystorhinitis due to sinusitis and resistant to appropriate medical treatment; (8) fungal sinusitis; (9) some meningocerebral infections; and (10) some neoplasms.
Possible indications are as follows: (1) in chronic rhinosinusitis that persists despite optimal medical management and after exclusion of any systemic disease, endoscopic sinus surgery is a reasonable alternative to continuous medical treatment; and (2) optimal medical management includes 2 to 6 weeks of adequate antibiotics (intravenous or oral) and treatment of concomitant diseases.

The participants of the Consensus Panel stressed that children who are eligible for sinus surgery represent only a small fraction of all children suffering from chronic rhinosinusitis.

CONCLUSIONS

There is more to pediatric rhinosinusitis than anatomical abnormalities and ostiomeatal complex obstruction.21 Rhinosinusitis in children is a multifactorial disease in which the importance of several predisposing factors changes with increasing age.20-28

The members of the Consensus Panel believe that more research is needed, especially in the areas of epidemiology and natural history, etiology, pathogenesis, and diagnosis of rhinosinusitis. The members of the Consensus Panel endorse and encourage continued study in these fields as well as carefully controlled comparative evaluations of medical and surgical therapies to determine the most safe and effective methods to prevent and treat rhinosinusitis in children.

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REFERENCES


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