CASE REPORT

Rare but numerous serious complications of acute otitis media in a young child

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SUMMARY

Acute otitis media is a very common disease in children. Most children recover with symptomatic therapy like potent analgesics, but occasionally serious complications occur. We present a 3-year-old girl who suffered from acute otitis media for already 2 weeks and presented with fever, abducens nerve palsy of her left eye and vomiting. She was finally diagnosed with an acute otitis media complicated by a mastoiditis, sinus thrombosis, meningitis and cerebellar empyema. *Fusobacterium necrophorum* was cultured from cerebrospinal fluid. The girl recovered following appropriate antibiotic and anticoagulation treatment.

BACKGROUND

Since the introduction of antibiotics and the improvement of the general state of health of children, complications of acute otitis media are rare. Symptomatic treatment is sufficient for most children. Only a few indications for antibiotic treatment exist. However, when complications do occur they are often serious and need immediate recognition and treatment. In a child, diagnosed with acute otitis media, that does not recover as might be expected, a thorough re-examination is warranted. Especially accurate neurological examination should be performed to recognise the first signs of complications that may occur despite previous antibiotic treatment.

CASE PRESENTATION

A 3-year-old girl visited the emergency department (ED) 2 weeks after the development of an acute otitis media. Initially she recovered after oral antibiotic treatment (amoxicillin, 7 days, 50 mg/kg/day) provided by her general practitioner. Four days before attending the ED fever recurred. At the day of presentation her mother reported that she started vomiting. Simultaneously she developed 'abnormal movements of her left eye and a wobbly walking pattern'.

On examination the patient was generally unwell. She had a temperature of 38.7°C. There were no clear meningeal signs. She had an abducens nerve palsy of her left eye and when walking she made a couple of wobbly steps. Furthermore there was left-sided otorrhea. The remainder of the general physical and neurological examination was normal.

INVESTIGATIONS

Laboratory evaluation revealed a C reactive protein of 321 mg/l and a white blood cell count of $9.8 \times 10^9/l$. Cerebrospinal fluid showed pleocytosis

of 47 787/ml. *Fusobacterium necrophorum* was cultured in the cerebrospinal fluid. CT of the head revealed a mastoiditis, sinus thrombosis and cerebellar empyema (see figures 1 and 2).

TREATMENT

The patient was initially intravenously treated with broad-spectrum antibiotics (ceftriaxone) and dexamethasone. On the basis of the resistance profile of the *Fusobacterium* antibiotic treatment was changed to penicillin. Mastoidectomy and thrombectomy were performed and subsequently fraxiparine was started. Despite targeted antibiotic treatment the patient developed cerebellar empyema (figure 3) that required surgical evacuation.

OUTCOME AND FOLLOW-UP

After a long and intensive hospital stay with long-term intravenous antibiotics and anticoagulation therapy our patient recovered almost completely. Only when she is tired her parents notice a little disturbed movement of her left eye and balance problems. For this, she visits a physiotherapist on a regular basis. Recently she had a hearing test, which was completely normal.

DISCUSSION

In this case report, we pay specific attention to the fact that even in a common disease like acute otitis media (AOM) serious complications can occur.

Figure 1 CT scan, mastoiditis on the left side. On the right side there is normal air configuration in the mastoid (arrow).

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Figure 2 CT scan. Sinus thrombosis on the left side, 'empty δ sign'.

Since most (>80%) children with AOM recover with symptomatic treatment within a few days, wait-and-see is initially justified according to the guideline of the Dutch Federation of General Practitioners. This guideline only advises to start antibiotic treatment when a child is seriously ill at presentation, when a child does not recover within 3 days or when there are any risk factors for developing complications (eg, age below 6 months, anatomic defects in the hearing system or a compromised immune system). In our patient, antibiotic treatment was started because she had complaints for about 2 weeks and there was otorrhea at first presentation. When antibiotics are needed and fast recovery fails after the initiation of antibiotics, clinicians should be aware of complications.¹

Although the incidence is decreasing, complications still occur in patients with AOM.² Recognition of these complications is

Figure 3 CT scan. A subtentorial fluid collection suspect for cerebellar empyema.

important because they can be life threatening. Unfortunately, symptoms are often atypical due to previous antibiotic treatment.³ Thus, in a child with AOM, that does not recover as might be expected, a thorough re-examination (including accurate neurological examination) should always be performed to allow early diagnosis and treatment of complications.

Children with otitis media can develop *intracranial* complications (meningitis, brain abscess, epidural abscess, sinus thrombosis and subdural empyema) and *extracranial* complications (mastoiditis, facial nerve palsy, labyrinthitis, Bezold abscess and petrositis).⁴ Most patients have one complication, only a few have more than two complications.³ Our patient had five complications, which is above average. In our patient doctor's delay, caused by unrecognised atypical symptoms played a possible role in the number of complications.

For most complications the treatment modality is clear and includes antibiotics and/or surgery. However, the treatment of sinus thrombosis is controversial. Recent literature highlights the controversy of surgery and use of anticoagulation in the treatment of sinus thrombosis and the need for further investigation. In a retrospective case series and a combined literature search, from 26 patients all but one got anticoagulation therapy. Most patients (23/26) had complete clinical recovery whereas clot resolution occurs in only 9 of the 26 patients. Four patients had complications secondary to anticoagulation.⁵

Because the literature was not conclusive, expert opinions made us decide to start anticoagulation therapy with close monitoring of factor Xa activity. No complications secondary to this therapy did occur.

In conclusion, the vast majority of children with AOM do not need any antibiotic treatment. Thorough re-examination is warranted in a child, that does not recover as might be expected, to diagnose serious complications as early as possible.

Learning points

- ▶ Acute otitis media is very common in children. Generally, it has a good prognosis with symptomatic treatment.
- ▶ Occasionally very serious complications can occur. When not recognised on time, complications can be life threatening.
- ▶ A thorough physical examination, including neurological examination is warranted when a child does not recover as may be expected from an acute otitis media.

Competing interests None.

Patient consent Obtained.

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REFERENCES

- 1 Damoiseaux RAMJ, Van Balen FAM, Leenheer WAM, *et al.* Guideline of the Dutch Federation of General Practitioners. *Huisarts Wet* 2006;49:615–21.
- 2 Leskinen K. Complications of acute otitis media in children. *Curr Allergy Asthma Rep* 2005;5:308–12.
- 3 Wu JF, Jin Z, Yang JM, *et al.* Extracranial and intracranial complications of otitis media: 22-year clinical experience and analysis. *Acta Oto-Laryngol* 2012;132:261–5.
- 4 De Ru JA, Braun KPJ, Schilder AGM. Neurological complication in 3 children with acute otitis media. *Ned Tijdschr Geneesk* 2002;146:2329–34.
- 5 Sitton MS, Chun R. Pediatric otogenic lateral sinus thrombosis: role of anticoagulation and surgery. *Int J Pediatr Otorhinolaryngol* 2012;76:428–32.

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