

Middle ear infection: Will antibiotics help relieve the symptoms in babies and young children?



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More about acute middle ear infection in babies and children in this video (URL: <http://www.informedhealthonline.org/index.781.en.html>) .

You can learn about how the ear works in a second video (URL:

<http://www.informedhealthonline.org/index.780.en.html>)

.When a baby or small child gets an infection like a cold, it can easily spread from the nose or back of the throat up into the middle ear. This is because the ears, nose and throat are closely connected, so the bacteria do not have far to travel. Middle ear infections can cause pain and fever, which can be treated with painkillers such as paracetamol or ibuprofen.

Sometimes so much fluid collects that the eardrum bulges under the pressure. This can temporarily make it harder for the child to hear. The eardrum may burst and fluid may leak out of the middle ear ("otorrhoea"). This heals quickly, and the infection will usually clear up by itself within one to three days: in 8 out of 10 babies (80%), the infection is completely gone after three days. The others are usually better within a week. Sometimes, though, ear infections can become chronic.

The medical term for acute middle ear infection is "acute otitis media" (AOM). AOM is one of the most common reasons babies are taken to the doctor. About 30% of babies and children under the age of three will be seen by doctors for middle ear infections in any one year (3 out of 10 babies and toddlers). By the time they are three months old, 1 in 10 babies will already have had a middle ear infection (10%).

The middle ear is the area just behind the eardrum and in front of the inner ear. It contains several small bones called the ossicles (the hammer, the anvil and the stirrup). The sounds that reach the eardrum are passed on to the inner ear, where the hearing organs convert them into messages that are sent to the brain. You can find out more about how the ear works here (URL: <http://www.informedhealthonline.org/index.370.en.html>) .

Development and treatment of acute middle ear infections

The space inside the middle ear (tympanic cavity) is usually filled with air. But if the membranes lining the ear get infected, they can become inflamed and swollen. The inflammation can produce fluid which will start to fill up the space. Fluid usually drains out of the middle ear down the eustachian tube, which empties out at the back of the nose and throat. However, when small children have colds and other infections around their noses and throats, the infection can travel up the eustachian tube very quickly, making it swell up. Typical symptoms of an acute ear infection include sudden severe earache, fever and hearing difficulties.

Because AOM clears up by itself so quickly, the worst is usually already over by the time parents have taken their baby to the doctor. This means that treatment other than pain relief probably cannot make a big difference for most children. The main treatments for AOM are painkillers (analgesics), decongestant nasal sprays or drops, and antibiotics. Nasal sprays are only for short-term use. Antibiotics might help with infections, but they could also cause adverse effects. You can find more information on the safe use of antibiotics here (URL: <http://www.informedhealthonline.org/index.468.en.html>) .

Research on antibiotics for acute middle ear infections

Researchers from the Cochrane Collaboration, an international network of researchers, looked for trials that could help show what the best role for antibiotics might be for babies and small children with AOM. The researchers studied the results of ten randomised controlled trials of antibiotic treatment involving a total of nearly 2,800 babies and young children between the ages of one month and 15 years.

The researchers wanted to know what effect antibiotics had on pain and fever after one to seven days of treatment. They were also interested in whether children who took antibiotics had fewer complications like hearing problems, or the spread of the infection to the other ear or the mastoid process (bony bump behind the ear). They looked at the data on adverse effects too.

Antibiotics usually do not help

The Cochrane researchers found that for many children with AOM, antibiotics did not speed up the healing process. Within 24 hours of taking antibiotics, the children's pain had not gone away any quicker than in children who had not taken antibiotics. Within a week,

the pain had gone away a bit sooner in children who had taken antibiotics. However, the pain went away on its own within a few days in 4 out of 5 children (80%) anyway. The spread of infection to the other ear and hearing problems were just as rare in children who had taken antibiotics as they were in children who had not. Only one of the nearly 2,800 children in the studies had an infection of the mastoid process (bony bump) behind the ear, despite taking antibiotics. None of the children who did not take antibiotics had this complication.

It is possible that antibiotics may be more effective at preventing complications when used in certain high-risk groups of children. The number of children who participated in the ten trials may have been too small to identify such high-risk groups and collect enough data on rare complications.

When they analysed the data on adverse effects, the Cochrane researchers found that problems like nausea, vomiting, diarrhoea and rashes were more common in children who had taken antibiotics than they were in those who had not. The results showed that 16 out of 100 infants and children (16%) who had taken antibiotics had at least one of these adverse effects, compared to only 12 out of 100 infants and children (12%) who had not taken this medication.

Other researchers analysed studies that looked into whether certain groups of children benefited more from antibiotics than others. They found two such groups: children who are under two years old and have an infection in both ears, and children of all ages who are leaking pus from their ear (otorrhoea). These symptoms indicate that the child has a bacterial infection, which can be treated effectively with antibiotics. Of the children who were under two years old and had an infection in both ears, 55 out of 100 (55%) of those who did not take antibiotics still had pain or fever after three to seven days of treatment, compared to 30 out of 100 (30%) of those who did take antibiotics. That means that antibiotics helped one in four of these children. Antibiotics also helped in children who had fluid leaking from their ears: without antibiotics, 60 out of 100 (60%) of them still had pain or fever, but with antibiotics only 24 out of 100 (24%) did. That means that antibiotics helped nearly one in three of those children.

Conclusion

The researchers concluded that if a child is less than two

years old, has AOM in both ears and/or there is infected fluid leaking from their ears, antibiotics are likely to help. However, for other children, it might be best to wait and see for a day or two, in order to avoid the risk of adverse effects of antibiotics. Painkillers will relieve the pain more quickly than antibiotics. If you take the "wait and see" approach, it may be a good idea to go to the doctor for a check-up once the symptoms have died down.

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Glossary

antibiotics

Antibiotics are medicines that can be used for bacterial and some fungal infections. Antibiotics do not work against viruses. Well-known antibiotics include penicillin, tetracycline and chloramphenicol.

bacteria

Bacteria are micro-organisms that, unlike viruses, can exist on their own. Viruses, on the other hand, can only exist inside a living cell. Most bacteria are not harmful to people, and some are actually beneficial. Bowel bacteria support bowel health. However if they get into the urinary system, they can cause an infection there. Doctors prescribe antibiotics for illnesses where bacteria need to be stopped or killed off. Immunisation is also possible against some bacterial infections, such as diphtheria, tetanus or whooping cough.

Cochrane Collaboration

The Cochrane Collaboration is an international network of thousands of researchers and others. They work together in teams called Cochrane Review Groups to answer questions about health care by doing systematic reviews of evidence. To achieve this, the members of the Collaboration have developed systems and methods for systematically finding and analysing the results of trials of health care interventions. The goal of the Cochrane Collaboration is to help patients, health care practitioners and others make more informed decisions about health care. You can read more about the Cochrane Collaboration at their website.

infection

In medicine, we speak of an infection when a person has caught a germ (an infectious agent). This germ can be a bacterium, a virus, a fungus or a worm. The germ multiplies and then either spreads throughout the body or only attacks one particular organ. As long as there are no signs of a disease, this is called an asymptomatic infection. When the body shows a reaction to the germ in the form of symptoms, this is called a symptomatic infection (an infectious disease). The period between the moment the germs enter the body and the moment the first symptoms of the disease appear, is called the incubation period. It may last a few hours or days, or even many years. An infection does not necessarily have to lead to the onset of a disease.

inflammation

An inflammation is a (defense) reaction of the body to an injury, irritation or infection. More blood is brought to the respective body part to protect the body. This is why this body part feels warmer, becomes swollen and red and is usually more sensitive. If the inflammation affects the mucous membranes, they secrete more fluid than usual. This helps to wash out the germs that have entered.

Sources

IQWiG health information is based on research in the international literature. We identify the most scientifically reliable knowledge currently available, particularly so-called "systematic reviews". These summarise and analyse the results of scientific research on the benefits and harms of treatments and other health care interventions. This helps medical professionals and people who are affected by the medical condition to weigh up the pros and cons. You can read more about systematic reviews and why these can provide the most trustworthy evidence about the state of knowledge here (URL: <http://www.gesundheitsinformation.de/evidence-based-medicine.61.en.html>) . The authors of the major systematic reviews on which our information is based are always approached to help us ensure the medical and scientific accuracy of our research summaries.

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The German Institute for Quality and Efficiency in Health Care (IQWiG)

The German Institute for Quality and Efficiency in Health Care (IQWiG) was established by legislation to provide evaluations of the effectiveness, quality and efficiency of healthcare services. This includes the assessment of medicines as well as the publication of health information for consumers and patients.

Evidence basis of our health information

Our information is based primarily on systematic reviews of the effects of health care. Systematic reviews are necessary to gain an objective picture of health care. In order to do this, a clear question is formulated. Researchers then find all the relevant studies that could answer this question. They then evaluate those studies.

You can find a list of the evidence and other scientific literature on which this information is based at **www.informedhealthonline.org**

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