

# Adolescent with respiratory impairments and short-lived fever

Choice of treatment can be challenging in the casualty clinic. Early in the disease course in particular, clinical signs can be sparse and diagnostic tools limited. Sometimes the road to ruin is paved with good intentions.

*A boy in his early teens attended the casualty clinic with his father after a day of fever, headache, shortness of breath, dizziness and soreness over much of his body. He had not had a cough. The patient was previously healthy and used no medication. Upon examination he did not appear to have respiratory difficulties, had no retractions and no use of the accessory muscles. Slight wheezing could be heard upon expiration. He had a respiratory rate of 20/minute and normal peripheral capillary oxygen saturation of 98%. Pulse was 120 beats/minute, temperature measured aurally 38.2 °C and CRP 11 mg/l (< 5). He was able to swallow, had normal tonsils, no swelling of the lymph nodes in the neck and normal heart sounds.*

*Two years previously, the patient had experienced gastrointestinal symptoms, including dysphagia, vomiting and nausea, but a thorough work-up in hospital had not revealed anything amiss. The year before that, he had had palpitations and had undergone 24-hour ECG and cardiac ultrasound. No abnormalities were found, and he had no such problems now.*

Symptoms of a respiratory tract infection are among the most common reasons for attendance at GP surgeries and casualty clinics. In the current case, a viral upper respiratory tract infection is a likely diagnosis, while infection-triggered obstructive pulmonary disease, pneumonia and influenza are possible differential diagnoses. It was not influenza season, but there was an ongoing mycoplasma epidemic. Symptoms of atypical pneumonia are a long-lasting severe dry cough, sore throat and headache, but the patient had neither a cough nor a sore throat.

Rarer differential diagnoses were considered unlikely. He had a low risk of pulmonary embolism and no stabbing pains upon inspiration. The absence of pain also made pneumothorax and pleuritis unlikely. In addition, he had similar respiratory sounds on both sides. With tuberculosis we would have expected a cough, which he did not have. He had no heart problems and there was no suspicion of heart failure.

*Due to a slight suspicion of atypical pneumonia, and because the consultant perceived a wish for antibiotic therapy from both father and son, the patient was placed on erythromycin 250 mg × 4 for seven days. The boy had a penicillin allergy, but this did not affect the choice of antibiotic as *Mycoplasma pneumoniae* was the suspected causative agent. Although shortness of breath was the presenting complaint, examination did not reveal objective breathing difficulties. Nevertheless, a suggestion of pulmonary obstruction meant that he was given a prescription for a salbutamol inhaler.*

Bronchitis and pneumonia are frequent causes of shortness of breath. Bronchitis is chiefly attributable to viruses, while pneumonia in adults is usually caused by bacteria. The most common agents outside hospitals are *Streptococcus pneumoniae*, followed by *Chlamydomphila pneumoniae* and viruses, as well as *M. pneumoniae* during epidemics every few years. In children over three months, the aetiology is reversed, with viruses the most common agents. Bacteria are the main cause in the very young.

Bacterial pneumonia should always be treated with antibiotics. Since *S. pneumoniae* is the most likely cause, phenoxymethylpenicillin is the first choice in both adults and children. In the event of a penicillin allergy or high probability of *M. pneumoniae* or *C. pneumoniae* infection, doxycycline or erythromycin are recommended for adults, and erythromycin for children. In patients with an impaired immune response or chronic obstructive pulmonary disease (COPD), amoxicillin is recommended (1).

In general practice, we rarely know the identity of the causative agent until potentially several days after the consultation. To aid diagnosis, we have the medical history, clinical examination and C-reactive protein (CRP) level. CRP levels increase over the first 1–2 days. Values below 20 argue against a bacterial infection, whereas values above 75–100 are suggestive of one. The significance of intermediate values is less clear. CRP values as low as 20 can be seen

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with chlamydia- and mycoplasma-pneumonia, while values of 50–100 are observed with both influenza and acute bronchitis (1). Our patient had a CRP level of 11, which suggests a viral agent. However, given that he had been ill for only 24 hours, the CRP value could not be taken as definitive evidence of this.

Peak expiratory flow (PEF) was not measured and a chest X-ray was not performed, although both are available in the casualty clinic. Chest X-rays are reserved for cases in which there are implications for treatment – such as with suspected pneumothorax or where revealing a lung infiltrate would clarify an uncertain diagnosis. PEF is rarely measured since its usefulness is limited by the fact that the patient's normal values are usually unknown.

*Two days after the first consultation, the patient and his father returned to the casualty clinic. The boy had had severe vomiting and diarrhoea for two days, and vomited every time*

*he attempted to drink. He was limp but ambulant, and no longer had symptoms related to the respiratory tract. There was neither blood nor mucus in his stools, and he had no stomach pains. No-one else was ill in the community, and he had not been out travelling. He still had a low-grade fever of 38 °C measured orally. Respiratory rate and oxygen saturation were normal, as were lung sounds. The abdomen was not tender, there were no palpable masses and no hepatosplenomegaly. CRP level was 12. He seemed mildly dehydrated with tachycardia (115/min) and ketonuria (3+ with urine dipsticks).*

Common causes of vomiting and diarrhoea are viral gastroenteritis, bacterial intestinal infections, food poisoning and side effects of antibiotics. Macrolides such as erythromycin are known to cause disturbances of the gastrointestinal tract. The vomiting and diarrhoea were judged to be side effects of the erythromycin. The antibiotic was therefore discontinued, as the pneumonia diagnosis was

considered unlikely. He was given a prescription for the antiemetic metoclopramide (20 mg suppositories up to three times daily).

*Three days after the initial consultation the boy and his father were back again. The shortness of breath and palpitations had returned. The vomiting had continued, but now only once a day. He had been able to drink, but was eating very little. His pulse was regular, with rate 120/minute. ECG showed T-wave inversions in the inferior and lateral leads, and sinus rhythm with no widening of the QRS complexes. He had mild tachypnoea (rate 20/min) with deep respiration. There was no acetone odour on his breath. Urine dipsticks showed, as previously, ketones +3, blood glucose 5.2 mmol/l (3.9–6.9) and haemoglobin 15.0 g/dl (11.0–16.0). Chest X-ray, which was performed during this third consultation, was normal.*

The most common causes of ketonuria are vomiting/diarrhoea and fasting. In cases

where there is also glucosuria, shortness of breath or decreased alertness, diabetic keto-acidosis would be an obvious diagnosis. However, the boy had normal blood sugar levels and no glucosuria, thus this diagnosis too was ruled out. The ECG findings were regarded as being of no significance.

*The doctor consulted a paediatrician by telephone, and the patient was offered hospital admission for observation. He did not want this and went home with instructions to continue the metoclopramide and to seek medical assistance in the event of deterioration.*

*Five days after the first consultation, the patient was back. This time, the presenting complaint was recorded as «back pain – arched back». The patient reported that he had that same day developed pain in his upper body, both front and back, and that his body involuntarily adopted abnormal postures. During the consultation, he experienced an attack in which he arched his neck and back and cried with pain. He had been vomiting from the onset of the illness to the present day and had used metoclopramide 20 mg, three suppositories daily for two days to combat nausea and vomiting.*

*He was referred to the paediatric unit with a tentative diagnosis of dystonia as a side effect of metoclopramide. He was examined in the hospital outpatient clinic without any severe neurological disorder being detected. He was given intramuscular biperiden to counter a dystonic reaction to metoclopramide, to good effect.*

Dystonia is characterised by involuntary movements, typically of a writhing or repetitive nature, and can be seen in various severe genetic disorders that begin in childhood/adolescence. Secondary dystonia can be triggered by multiple sclerosis, encephalitis, parkinsonism or by drugs such as metoclopramide.

*The following day the patient returned to the casualty clinic. Six days had passed since his first consultation and the presenting complaint this time was palpitations. He had not vomited that day and was managing to eat. Mild tachycardia with a heart rate of 110/minute was the only abnormal finding upon examination, his pulse was regular and there were no heart murmurs. ECG was normal and the patient was given reassurance. He went home without any further interventions. His relatives reported six months later that he is healthy and not taking any medication.*

## Discussion

Of those who visit a doctor with a respiratory tract infection, one third receive anti-

biotics. Of these, 41% are given phenoxy-methylpenicillin, and the remaining 59% mainly macrolide antibiotics. Prescribing practices seem to deviate from guidelines both in terms of higher prescription rates and greater use of broad-spectrum antibiotics than recommended (2). According to guidelines, bronchitis should not be treated with antibiotics as it is most often caused by a virus (1). Nevertheless, in Norway more than half of those diagnosed with bronchitis do receive antibiotics (2). Children with respiratory tract infections are given macrolides and broad-spectrum antibiotics more frequently than adults. The palatable taste of the mixture improves compliance and is a likely explanation for this (3).

Why do doctors prescribe antibiotics in cases of doubt? In an Icelandic study (4), uncertainty over the causative agent and the diagnosis, and the limited time available in which to observe the patient were cited as reasons for prescribing antibiotics. The potential for the doctor-patient relationship to be damaged by disagreement over the need for antibiotic treatment was also highlighted. Others suggested that it is better to treat than «to do nothing» and that not prescribing antibiotics can be perceived as a failure by the doctor to appreciate the patient's difficulties. A previous bad experience with a poor outcome in an earlier patient could lead to a doctor prescribing antibiotics «for safety's sake». Time constraints, and expectations of patients and relatives regarding antibiotics, were also cited as reasons. Similar findings have been reported in several other studies (5–8). Interestingly enough, in a number of cases there was a discrepancy between the doctor's interpretation and the wishes of the patient/relatives.

In the casualty clinic where the patient is continually met by new and often young doctors, there can be uncertainty on the part of both patient and doctor. The doctor can safeguard the situation by asking the patient to return if there is any deterioration. Our patient should have been given a more thorough explanation of the expected disease course and been encouraged to contact his general practitioner rather than the casualty clinic if there was no improvement. Training in the provision of good quality information about antibiotics, expected disease course and when to contact the doctor again, has been shown to improve patient acceptance of lower prescription rates (9).

This patient was perceived by doctors as subjectively suffering and expecting to receive antibiotics. He seemed anxious, and the doctors interpreted this as a wish for treatment just to be on the safe side. The patient kept returning to the casualty clinic and these factors combined to produce overtreat-

ment. The treatment had severe side effects, namely vomiting, nausea, diarrhoea and dehydration. The palpitations might have been a side effect of salbutamol or a symptom of dehydration or stress.

Instead of simply having his antibiotics discontinued, the patient was also prescribed metoclopramide to combat vomiting and nausea. One should think carefully before treating medication side effects with new medications. Dystonia is a common side effect of metoclopramide and affects between 1/10 and 1/100. Children are particularly vulnerable, and metoclopramide must be used at lower doses in children under the age of 15 years (10). Regrettably, in our case the boy was given an adult dosage.

The patient had previously undergone extensive investigation despite his young age, without anything abnormal being found. In the discharge summary, which we subsequently obtained from the hospital, the question was raised as to whether his symptoms could be psychogenic, but we have no information from the GP regarding follow-up of this issue. Uncertainty and anxiety in patients can be misinterpreted by doctors as expectation of further investigation and active treatment, while patients' uncertainty over their own health can also lead them to repeatedly contact the health care services. Repeated contact is a signal that doctors are trained to take seriously. The result is therefore often extensive examination, referral to second-line services, or overtreatment, as was the case here.

The ECG findings in this patient were non-specific and probably of no significance. An earlier cardiac assessment had concluded that his heart was healthy. This illustrates some of the drawbacks of carrying out ever-new tests. Each test brings with it the possibility of detecting further discrepancies that serve only to increase uncertainty rather than narrow down the diagnosis (11).

Antibiotics were unnecessary in this patient. With such a short illness it was too early to suspect atypical pneumonia, and a CRP value of 11 offered no evidence for a bacterial respiratory tract infection.

Are there any negative consequences of restrictive prescribing practices? A marginally higher incidence of mastoiditis is found in countries with lower antibiotic use (12). One study reported that 0.5–1.5% of patients with bronchitis who were not given antibiotics subsequently contacted their doctor again with pneumonia that needed treatment (13). Another study (14) showed a possible slight increase in mortality from pneumonia outside hospital with stricter prescribing practices, but this study has been criticised for serious methodological failings (12).

We believe that fear of complications and concern that the patient might not seek medical help in the event of deterioration were the main reasons for overtreatment in our case. We also believe that these are important reasons for treatment in many cases of doubt. One study found that patients were equally satisfied whether or not they received antibiotics (7), but it takes more time not to prescribe. Indeed, a correlation has been shown between a busy doctor and a higher prescription rate (2).

It takes time to reassure patients and their families by providing good quality information, making sure that they understand this information and that they can accept responsibility for contacting a doctor again if the condition worsens and the disease course is not as expected. It is a pity if doctors prescribe antibiotics to be «nice» to patients without even knowing whether they are interested in treatment on the basis of minimal evidence «just in case». It can, as here, lead to overtreatment and unnecessary discomfort for the patient. For society as a whole, it has major negative consequences in terms of increased antibiotic resistance. In cases of doubt, it can help to ask the patient for his/her thoughts regarding treatment.

The last doctor wrote in the consultation notes that he had reassured the patient that his body would resolve the problem perfectly well without medication. That was the last consultation. Good quality, sound information is often good treatment. In our eagerness to be effective doctors we must not forget our commitment to first do no harm. To do «nothing» is also to do something.

*The patient and his relatives have consented to the publication of this article.*

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