

TEACHING FILES (GRAND ROUNDS)

GROWTH OF MYCOBACTERIUM TUBERCULOSIS (MTB) ON SPUTUM CULTURE IN AN ASYMPTOMATIC CHILD

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Clinical Problem

A 6-year-old female was referred to us for evaluation of incidentally discovered right-sided cervical lymphadenopathy for one month. She had a cough initially for a week but now did not have any complaints. Her mother was treated for genital tuberculosis (TB) 6 years ago and had received anti-tubercular therapy for 6 months. The child had been investigated for TB before referral to us and her tuberculin sensitivity test (TST) was negative, HIV ELISA was negative. Ultrasonography (USG) of the neck showed reactive lymph nodes. Fine needle aspiration cytology (FNAC) of the cervical gland showed non-specific caseation with histiocytosis. Complete blood count, chest radiograph and abdominal USG were normal. A sputum sample had been done which grew Mycobacterium tuberculosis (MTB) after 6 weeks. On presentation to us, she had multiple, 1 cm by 1 cm, non-tender cervical lymph nodes. Her weight was 20.8 kg. Systemic examination was normal. We did a QuantiFERON TB-Gold test which was negative. A wait and watch policy was adopted. Meanwhile, drug sensitivity test (DST) of the MTB grown on culture showed resistance to isoniazid, rifampicin, and streptomycin. On follow up, she continued to be asymptomatic. A repeat chest X-ray after 3 months was also normal and ESR was 8 mm at end of 1 hour with no weight loss or fever. Her cervical nodes remained the same size, mobile and diffuse.

Why did the sputum sample grow MTB in this child?

Expert Opinion

The definitive diagnosis of TB depends on the bacteriological confirmation of MTB in the specimen sent for investigation by either culture or PCR technique. During the processes of collection and processing of clinical samples in the laboratory, contamination with MTB sometimes occurs, leading to false-positive cultures.¹ The occurrence of false-positive cultures is not widely recognized.² False-positive cultures can occur due to laboratory cross-contamination, contamination of clinical devices and clerical errors.¹ By definition, a culture is considered false positive (a) if the DNA fingerprint of the isolate is identical to that of an isolate from another patient processed within 7 days in the same laboratory, (b) if the isolate is taken from a patient without clinical signs of TB, and/or (c) if the

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false-positive test result is confirmed by the peripheral laboratory and/or the public health tuberculosis officer.¹ The use of 70% alcohol for decontamination of laboratory equipment seems to be a risk factor for false-positive cultures.¹ In laboratories that process more than 3,000 samples a year, processing of the samples in a relatively small room seemed to be a risk factor for false-positive cultures.¹ The TB culture of our patient had been done in a smaller laboratory and thus may have led to a false positive culture.

Although a false negative TST can occur due to cutaneous anergy or recent TB infection⁴; a negative QuantiFERON TB-Gold test 3 months later in our patient further decreases the probability of being exposed to MTB. Also, the child continued to do well in spite of no treatment suggests that the test was a false positive test.

Clinicians and health departments can prevent the consequences of false-positive cultures by evaluating positive cultures critically as false-positive cultures are not rare.

Compliance with Ethical Standards

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