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Exaggerated Mantoux reaction – Necrotising changes

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ABSTRACT

Tuberculin skin test is very useful diagnostic tool to screen for tuberculosis infection. This test can be taken as positive if there is formation of induration in the injected site within 48 hrs of injection. Sometimes rarely, formation of vesicles, bullae, necrotic changes can occur. Here we report a 14 years old girl who developed necrotic changes following tuberculin skin test. A 14 years old adolescent girl came with swelling in right side of neck for 15 days. She was earlier suspected to have pulmonary tuberculosis and started on ATT. She discontinued ATT after one month and presented to us a month later. She had no pulmonary symptoms, the swelling was not a typical cold abscess and her treatment records did not mention any evaluation or rationale for the diagnosis of TB and indication for initiating ATT. She was hence evaluated. Mantoux was given, she developed bullous lesion followed by ulceration and necrotic changes. FNAC of the swelling was done which was positive for AFB. The child was started with Antitubercular drugs. In this case, the necrotic response is probably due to previous exposure to tuberculin protein by means of Mantoux testing done before initiation of ATT which was not documented. Apart from the possibility of a false positive response to repeated Mantoux administration, the risk of necrotic local reaction also exists, reinforcing the need to avoid repeated testing.

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INTRODUCTION

Tuberculosis is a significant disease that is the second most common cause of death from an infectious disease worldwide. Almost1/3rd of world's population is infected with Mycobacterium tuberculosis, more commonly seen in developing countries (Lindsay A. Hatzenbuehler and Jeffrey R, 2016). In children, one of the common diagnostic tests to screen for tuberculosis is the Mantoux test. This is also called as tuberculin skin test or purified protein derivative (PPD) test (Stop TB, 2006; Britton P *et al.,* 2013). Here we report a case of a tuberculin test induced a necrotic reaction in a child who was partially treated for the tuberculosis infection.

A CASE REPORT

A 14yr old female child was belonging to lower middle class presented with swelling in the right side of the neck for 15 days. Swelling progressively increased in size and was painful. She had loss of weight and appetite. She was started on ATT for suspected pulmonary tuberculosis which she took for 4 weeks and then discontinued for 4 weeks until she came to us. On examination, she had Pallor, cervical lymphadenopathy, Alopecia, and Supraclavicular hollowing, BCG scar was absent. The swelling size 3×3 cm in size, warm, tender, and soft in consistency. She had no pulmonary symptoms, the swelling was not a typical cold abscess and her treatment records did not mention any evaluation or rationale for the diagnosis of TB and indication for initiating ATT. She was hence evaluated. ESR was elevated (Al-Nashi *et al.,* 2013). Mantoux test was done with 5TU injected intradermally in the

volar aspect of the left forearm. Within 12 hours child developed erythema and by 48 hours a 2 cm bullous lesion appeared followed by ulceration and necrosis (fig 1, 2). Sputum for AFB was negative twice. FNAC of the swelling was done which showed pus positive for AFB. The child was started with Antitubercular drugs (Al-Grawi *et al.,* 2018).

Figure 1: Location of TST in left forearm showing vesicles formation (48 hrs)

Figure 2: necrotic changes at Mantouxsite (72 hrs)

DISCUSSION

Tuberculin skin test is used to screen the population who has been infected with tuberculosis. The characteristic features of reaction to Mantoux test are delayed type hypersensitivity reaching a peak of more than 24 hours after injection with induration and occasional vesiculation. The reaction is read by marking the transverse diameter in millimetres with a transparent ruler. Due to the test's low specificity, many positive reactions in low-risk individuals is false positives. The most important reason for a false positive result is infection by non-tuberculous mycobacteria or previous administration of BCG vaccine. BCG induced sensitivity to tuberculin is also weaker than sensitivity induced by infection with tubercle bacilli (Johnson H *et al.,* 1995). False positives can also occur when the injected area is touched, causing swelling and itching. Almost all reactions with induration of 15 mm or more in size may be attributable to infection with tubercle bacilli, irrespective of BCG vaccination (Chadha VK and Challu VK 2009).

Some subjects with massive exposure to mycobacterial antigen show an immediate erythematous reaction with itching and irritation that peaks at 6-8 hours and disappear by 24 hours. "Immediate" hypersensitivity response within 48 hours of tuberculin test, is a sign of allergy. A few rare reactions of tuberculin test have been reported. Swelling, redness of arm, vesicles have also been reported particularly in individuals who have been infected previously or had tuberculosis or previously received BCG (Al Aboud D, 2016). Bullous reaction or giant blistering due to TST have been reported (Blossom AP, Cleary JD 2003; Nicolás-Sánchez FJ *et al.,* 2006; Avasthi R *et al.,* 2009). Around 1% to 2 % of cases associated with blister formation (Menzies D *et al.,* 1999). Necrotic reaction due to tuberculin skin test is a very rare side effect. Estimated incidence for necrotic Mantoux is 0.8 per 1000 (Dim Bunnet *et al.,* 2015). There have been two cases reported with necrotic changes in case of cervical lymphadenopathy (Khan UH *et al.,* 2013; Lu CY *et al.,* 2007). Probable causes of necrotic Mantoux reactions are active tuberculosis infection, BCG has given instead tuberculin, previous tuberculin testing, high mycobacterium load, tuberculin given in high doses and cases of lepromatous leprosy caused by Mycobacterium leprae (Waters MF *et al.,* 1985). Tuberculin PPD also contains a small amount of phenol, which could, in theory, contribute at least initially to a strong response and necrosis (Landis *et al.,* 1968).

In our patient, standard dosage of PPD was used and Mantoux tests done with the same vial did not produce a similar reaction in other patients, ruling out overdosage / inadvertent BCG injection and vial contamination. The delayed evolution of the vesicles indicates hypersensitivity to PPD and not Type 1 hypersensitivity to phenol. The necrotic response is probably due to previous exposure to tuberculin protein by means of Mantoux testing done before initiation of ATT which was not documented.

CONCLUSION

Repeated Mantoux testing is of limited value it may lead to false positivity. Furthermore, it also leads to local complications like necrosis, as in this case, reinforcing the need to avoid repeated testing.

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