Improving TB IGRA sample rejection rates *a QIP*

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Abstract

Background

Ocular Tuberculosis (TB) can lead to visual loss secondary from irreversible destruction of the intraocular tissue. The British thoracic society suggests that TB IGRA samples should be sent to help with diagnosis[1]. Locally, it was noticed there was a number of occurrences where the test was not processed.

Aims

To understand why samples were being rejected, to identify whether this was a widespread issue and reduce the sample rejection rate to facilitate better patient care.

Methods

Retrospective analysis including all patients who underwent TB IGRA testing in the trust for a period of 8 weeks. An awareness intervention was devised which included visual posters and informing senior staff of the audit results. Following implementation, a second audit cycle was performed.

Results

There was an overall reduction in rejected samples from 29% to 26% following our intervention. The reasons for rejection were volumes being incorrectly filled (56%) and the samples not being received in time (44%). These proportions remained the same in both cycles.

Conclusion

The nature of the intervention will build awareness in a progressive manner and penetration of the information into the workforce will be gradual. Further communication with the local pathology service and the logistical chain is being conducted, with the aim of reducing the rejection rates further followed by additional analysis.

There is no current clinical gold standard for diagnosis of latent TB. Two types of test are available locally, QuantiFERON-TB Gold and the T-spot sample. These tests are used to determine the probability of latent TB infection in patients. They are an indirect marker of Mycobacterium tuberculosis exposure and indicate immune response to *M.tuberculosis* and measure T-cell release of IFN-γ following stimulation by antigens specific to the *M. tuberculosis* complex. Their sensitivity is low in immunocompromised patients.

Patients with immune-mediated inflammatory diseases and/or suspected of latent TB who are being considered for anti-TNF therapy should be tested. TB has been found to be responsibility for a significant portion of uveitis cases. Development of active TB once infliximab treatment is started is rapid, with a median onset of 12 weeks and 98% of cases occurring within 6 months of initiation of TNF blockade[1].

We assess the rejection rates and reasons of the samples sent over two 8 week periods, with a period of investigation and intervention.

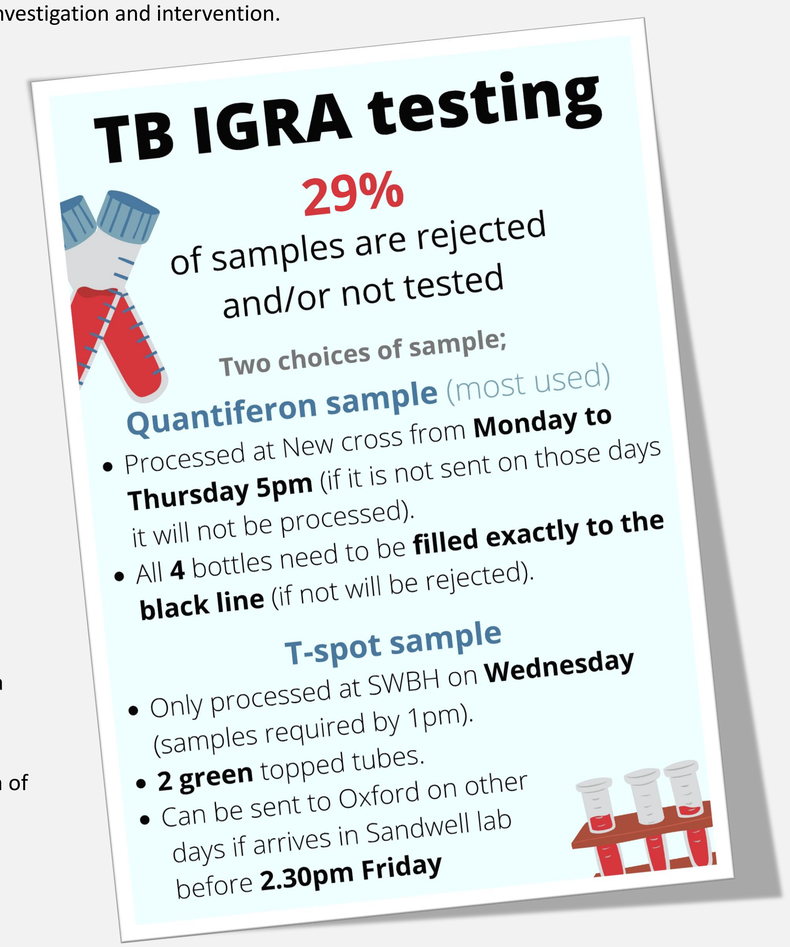
In the 1st audit cycle; 29% of samples sent were rejected. This confirmed the subjective feeling that prompted the audit, that a high number of samples were being rejected. It also identified difficulties identified with using the two different tests;

QuantiFERON-TB Gold

- *Multiple (4) bottles need to be filled to an exact line*
- *The test requires a 16h incubation period, and must be received by the laboratory 16h from venipuncture.*
- *The local laboratory is unable to process these on the weekends, and so the timings of this means samples cannot be taken between midday Thursday – Sunday.*

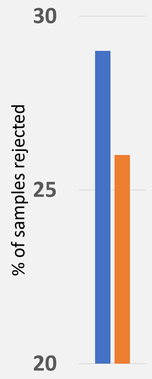
T-spot

- *This is only available on one day of the week (Wednesday).*
- *Sample has to be received within 8 hours from venipuncture and bottles have to be full.*
- *Between Monday and Friday, before 1pm, samples can be sent to an alternative laboratory via special delivery.*
- *This laboratory can receive and process samples up to 54 hours after blood collection.*



The two main reasons for rejection were identified as;

- Sample not received within 16hours of venepuncture
- Sample volume incorrect



In order to deliver an improvement in the TB-IGRA rejection rate we performed a number of interventions to tackle the causes of rejection identified.

- A visual information aide was erected in locations samples are often taken.
- This was also emailed to the professionals involved in the order and collection of TB-IGRA samples.
- Correspondence with TB clinics to see if facing similar issues
- We held discussions with local laboratories to identify common errors.

This was designed to improve the fill rates, and awareness of when the lab could accept the different types of samples.

In the 2nd audit cycle; 26% of samples sent were rejected. The proportion of those rejected for filling defects and sample timing remained the same. This improvement was not statistically significant.

Limitations we identified were as follows; Only two months data were collected for each cycle, with 31 and 34 samples included the analysis. There was only a short time between intervention implementation and re-audit, preventing the intervention taking maximal effect. Finally, we were unable to affect the laboratories working times or to move clinic times, preventing us from optimally dictating when samples might be taken. Patients travel significant distances in order to attend the clinic and it might not be possible to arrange blood collection locally or arrange an alternative time.

In conclusion, this quality improvement project demonstrates an improvement following an intervention which was not significant. We expect the rates of sample rejection to reduce with time as more people become aware of the limitations of testing. We also showed the importance of coordinating different services and of the laboratory informing clinicians of these to avoid samples being unnecessarily rejected.

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References: Lalvani, A. and Millington, K.A. (2008) “Screening for tuberculosis infection prior to initiation of anti-TNF therapy,” Autoimmunity Reviews, 8(2), pp. 147–152. Available at: https://doi.org/10.1016/j.autrev.2008.07.011.