Investigating Utilisation of the Rare and Imported Pathogens Laboratory Testing Service Through a Hub-and-Spoke Model of Laboratory Practice.

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Background

Fever in the returned traveller has a wide differential diagnosis, testing for individual pathogens increases costs and slows diagnoses.[1] In order to improve efficacy and reduce cost a centralised Fever service is offered by the Rare and Imported Pathogens Laboratory (RIPL), Porton Down.[2] Trusts referring samples through this service should have a robust mechanism ensuring time sensitive processing and integration of diagnostic RIPL results into patient care. This can be complicated by diverse mechanisms of laboratory service provision, including the recent moves towards hub-and-spoke models for pathology. To investigate how robust these mechanisms are, we conducted a multi-centre retrospective observational study of patients for whom RIPL testing was undertaken from North West London Pathology, a centralised laboratory situated at Charing Cross Hospital (CXH), serving the spoke sites Chelsea and Westminster trust (CW), Queen Charlottes (QC) Hammersmith (HH), St. Mary's (SMH) & Hillingdon Hospitals (HiH).

Method

A multi-centre retrospective observational study was performed for all samples sent to RIPL for regional syndromic panels between 01/04/2018-30/09/2018 via the centralised North West London Pathology hub laboratory. RIPL sample reports were extracted from the laboratory Management information system (Sunquest®). Clinical Information and further laboratory data was collected from institutional electronic health records (Lastword®, Evolve®, and Cerner®). Data was collected an analysed in Microsoft Excel. This audit was registered with the Imperial College Healthcare NHS Trust Governance office.

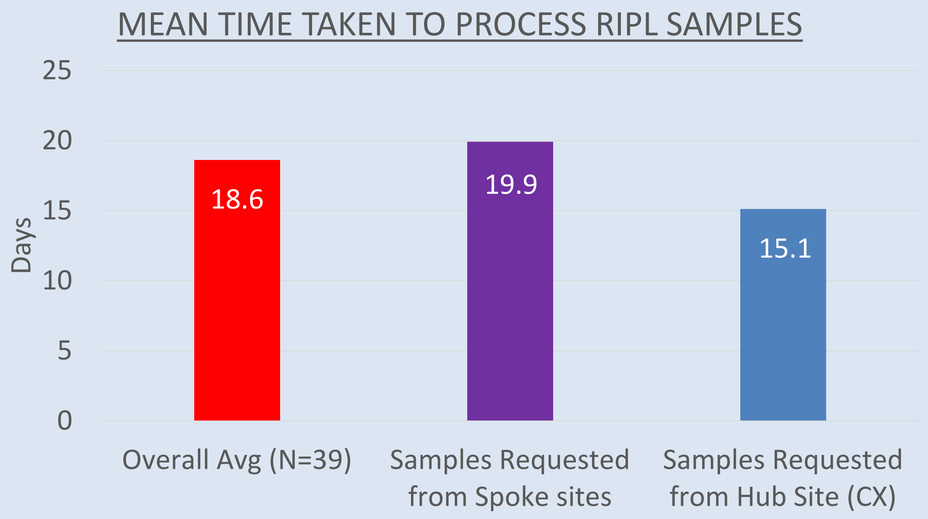
Results

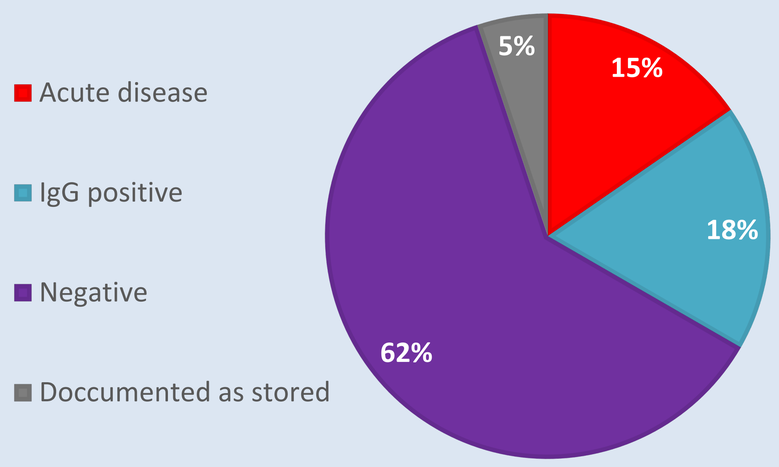
After de-duplication 52 samples were identified from 49 patients during the study period. 39 samples corresponded to completed and documented RIPL requests. 13 samples were not processed; 9 not received, 2 insufficient details, 1 improper packaging, 1 leaked. Of the 39 completed RIPL samples 6 were from CW, 12 CX, 6 HH, 12 SMH, 1 QCCH, and 2 HiH. 59% (23) were female. The mean patient age was 35years (range 1 to 78years).

Sample logistics: The mean time between requesting a RIPL sample and receiving a result was 18days 14hours (range 3days 20hours - 84days 14hours) with 1 result still pending. Samples. Waited in the centralised CX laboratory prior to being sent to RIPL for a mean of 2days 14hours (range 0 hours - 35days).The majority of the remaining turnaround time was at RIPL;mean 13days 10hours (range 2days 3 hours - 79 days). Overall it took notably longer for a RIPL sample to be resulted from a spoke site (19days 22hours) compared to requests from the central site, CX (15days 2hours).

Patient epidemiology & clinical presentation: The most common clinical presentation Documented was fever (26/39), clinical features such as myalgia, arthralgia, vomiting and rashes were also recorded. 22 different countries were visited by patients from whom RIPL samples were taken.

RIPL results: 6 samples provided evidence supporting acute infections (4 Leptospirosis, 1 chikungunya and 1 dengue). 7 samples demonstrated only IgG evidence of tropical diseases (2 dengue, 2 yellow fever, 2 spotted fever and 1 anaplasmosis). 24 samples were negative. 1 sample was reported as stored and 1 result was still pending at the time of writing this audit. Overall 16% of returned RIPL results came back positive for an acute infection. This rose to 30% if only samples from those who had travelled to South-East Asia were considered. Half of RIPL results indicating acute infection (3/6) were from patients who had recently returned from South East Asia.





BREAKDOWN OF ACUTE DISEASE RESULTS BY PATHOGEN IDENTIFIED (N)
Leptospirosis (4)
Chikungunya (1)
Dengue (1)

References

1.Thwaites GE, Day NP. Approach to Fever in the Returning Traveler. N Engl J Med. 2017;376(6):548-560.

2. PHE. Rare and Imported Pathogens Laboratory (RIPL) Specimen referral guidelines and service user manual [internet], 2018. Available: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/714550/SPATH039RIPL_User_Manual_May_2018.pdf

Conclusions

- Hub and Spoke models of pathology services can lead to large variations and notable delays in the time taken to process samples which are sent onwards to reference laboratories.
- In centres using a Hub and Spoke model a clear protocol is required to ensure an efficient diagnostic process and improve patient care.
- The proportion of RIPL results yielding evidence of acute Rare and Imported infections is low (15.3%), clear clinical guidelines regarding when to send RIPL samples need to be operationalised.

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