Understanding how scleroderma and myositis immunoblots are best utilised for investigating connective tissue disease patients.

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BACKGROUND

Specialist line immunoassays (LIA) are used to identify antibodies associated with systemic sclerosis and the inflammatory myopathies. The presence/absence of these antibodies cannot be used to diagnose or exclude these conditions but may provide additional evidence for a clinical diagnosis and also give prognostic information. There are two tests which are performed in-house that may screen for (but do not identify) some of the antibodies which are important in these conditions (CTD screen/Hep-2 cells). These tests have been used to make decisions on how likely it is that performing the specialist line immunoassays will result in the identification of a clinically important antibody, however there is limited information available about how reliable this approach is, either to exclude or support additional testing.

OBJECTIVES

To look at how effective the screening tests are at identifying patients with a clinically significant myositis or scleroderma antibody.

STANDARDS

No standards are available. Expert opinion guidelines suggest that the Hep-2 test is not helpful in juvenile inflammatory myopathy and cannot be used to exclude a positive result by LIA in adult myositis. Hep-2 can support the validity of a positive result by LIA in suspected myositis/scleroderma. A positive autoantibody result is not sufficient for diagnosis in either condition.

1) What is the distribution of true cases of systemic sclerosis/myositis when considering initial screening results and subsequent LIA testing ?

2) Are there cases of systemic sclerosis/myositis where the screening Hep-2 test is negative?

METHOD

All test results LIA from 2014-2019 were collated alongside the results of the two screening tests. All information was taken from the laboratory information management system and the electronic patient record. Where there was no clearly recorded diagnosis for a patient the record was excluded.

RESULTS:

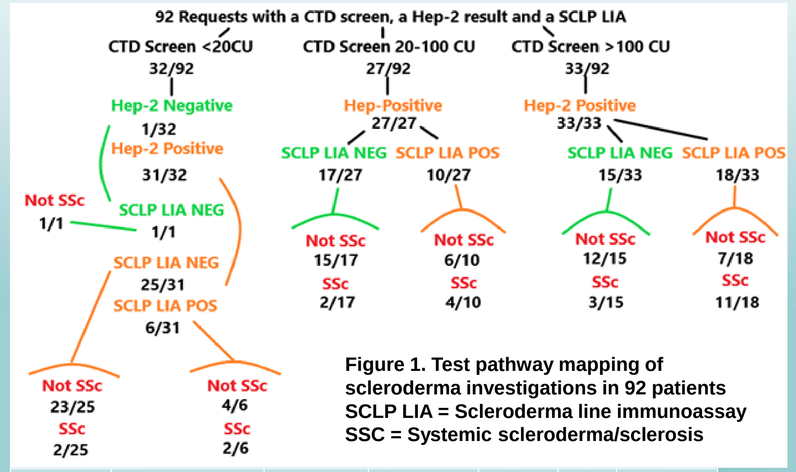

Figure 1. Test pathway mapping of scleroderma investigations in 92 patients
SCLP LIA = Scleroderma line immunoassay
SSC = Systemic scleroderma/sclerosis

Test	Prevalence of SSc	Sensitivity	Specificity	PPV	NPV	Accuracy
CTD	24%	83%	46%	33%	89%	55%
Hep-2	24%	100%	50%	26%	100%	32%
SCLP LIA	26%	71%	75%	50%	88%	74%

Table 1. Diagnostic statistics for Scleroderma investigations by assay

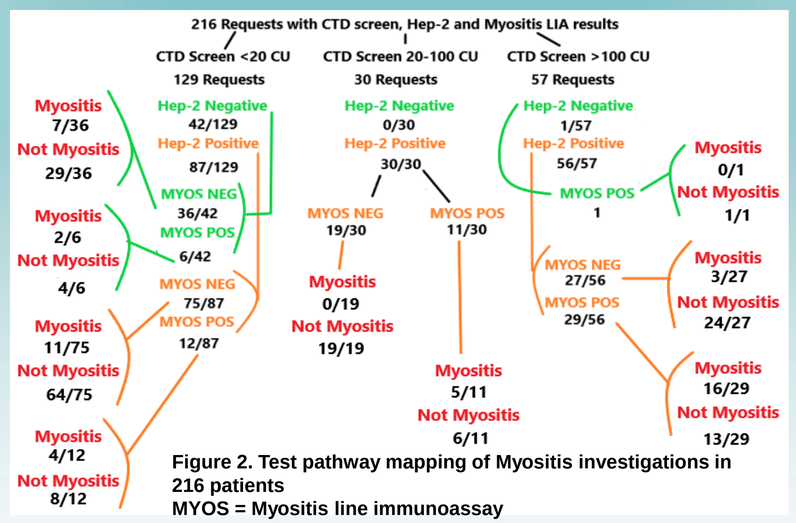

Figure 2. Test pathway mapping of Myositis investigations in 216 patients
MYOS = Myositis line immunoassay

Test	Prevalence of IM	Sensitivity	Specificity	PPV	NPV	Accuracy
CTD	21%	50%	64%	28%	82%	61%
Hep-2	24%	79%	26%	25%	80%	39%
MYOS LIA	23%	51%	84%	49%	85%	76%

Table 2. Diagnostic statistics for Myositis investigations by assay

DISCUSSION

Assay statistics show bias due to the retrospective nature of the analysis. However the screening assays appear to work well in identifying patients Hep-2 (100% NPV).
Myositis appears much harder for successful identification and this may need further clinical evaluation of how requests are made into this pathway.

RECOMMENDATIONS FOR IMPROVING CARE

To share results with rheumatological colleagues and understand their perspective on this practice.
To try and create a collaborative 'best practice' document between the laboratory and Rheumatology, that standardises this pathway as much as possible and helps educate primary care referrals.

ACTION PLAN

Planned Actions	Deadline	Person(s) responsible	Priority (table below)
Disseminate findings to Rheumatology colleagues and invite discussion of these findings to understand Rheumatology perspective on this patient cohort	Circulate to Rheumatology clinical team and invite comments and feedback to the data. Organise a meeting for results to be presented and discussed	Ross Sadler	Improvement
Create collaborative 'best practice ' document between the laboratory and Rheumatology, that standardises this pathway as much as possible and helps educate primary care referrals.	Identify members of Rheumatology team who would be interested in representing the specialty to work with the laboratory to create document. Set out clear objectives of what the document should be aiming to achieve	Ross Sadler/Kirsty Gordon/Rheumatology colleagues	Improvement

Priority of actions	Definition
Essential	High priority actions that must be implemented within 30 days to mitigate major risks identified
Required	Required actions that must be implemented within 3 months to mitigate significant risks identified
Improvement	Improvement actions that have been agreed which are not associated with significant risks (to be implemented within 6 months)