Accuracy of Commercial Myositis Panels: A Single-Institution Perspective

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Background

- Dermatomyositis (DM) is an idiopathic inflammatory myopathy (IIM) characterized by multiple cutaneous and systemic presentations
  - Diagnosis is often missed/delayed by an average of 15.5 months[1]
- Myositis-specific (MSA) and myositis-associated antibodies (MAA) are increasing in popularity
  - MSA/MAA present in > 50% of DM/PM patients[2]
- Commercial myositis panels are increasing in popularity
  - Multiple modalities, including line immunoassay (LIA), immunoprecipitation (IP), multiplex bead assay (MBA), and enzyme-lined immunoprecipitation assay (ELISA)
  - Among IIMs only 14% of had a positive MSA and 21% had a positive MAA using commercial panels[3]
- To characterize this discrepancy, we performed a retrospective study of patients in a prospectively-collected database of patients with DM
- Objectives of the study:
  - Characterize the use of commercial myositis panels in a clinical setting
  - Compare commercial myositis panels to research lab myositis panels

Methods

- 80 sera of DM patients sent to Johns Hopkins for research myositis panel
- EUROIMMUN Line Immunoblot Assay:
  - Mi-2, SRP, Ku, Ro-52, MDA-5, SAE-1, PM/Scl, and anti-synthetase antibodies (Jo1, PL-7, PL-12, OJ, EJ)
  - Good agreement with IP except for TIF1-γ[4]
- MBL Enzyme-linked immunosorbent assay (ELISA)
  - TIF1-γ
- Chart review for demographics & commercial myositis panel results
- Commercial panels categorized as “concordant” or “discordant”
  - Concordant – All results of commercial panel agree with JHU panel
  - Discordant – Commercial panel results contradict JHU panel results (false positives or false negatives)

Disclosures

- No conflicts of interest to disclose

Table 1: Patient Demographics

Median Age at Blood Draw (IQR) (years)		53.5 (39.1 – 58.7)
Sex	**Male**	1 (5.6)
	Female	17 (94.4)
Race	**Caucasian**	16 (88.9)
	African American	1 (5.6)
	Asian	1 (5.6)
DM Type	**Classic**	7 (38.9)
	Amyopathic	11 (61.1)
Medication Use History	**Antimalarials**	9 (50)
	Immunosuppressants	8 (44.4)
Time between Commercial and Research Lab Sera Collection (IQR) (days)		73.5 (27.3 – 128.8)

Table 2: Comparison of Commercial Myositis Panels

Commercial Lab (n=18)	Modality	Antibodies in Panel	Concordance Rate (%)	Discordance Rate (%)
ARUP Labs (n = 6)	LIA	PM/Scl, SAE1, MDA5, NXP2, TIF1-γ	3 (50)	3 (50)
	IP	Mi-2, PL-7/12, EJ, Ku, SRP, OJ		
	MBA	Ro 52, Jo-1		
Quest Labs (n = 6)	LIA	OJ, EJ, PL-7/12, Jo-1, Ku, Mi-2	6 (100)	0 (0)
RDL Reference Laboratory (n = 3)	Radio-IP Assay	Ro-52, OJ, EJ, PL-7/12, SRP, Jo-1, PM/Scl, Ku, Mi-2	3 (100)	0 (0)
Immco Diagnostics (n = 3)	LIA	OJ, EJ, PL-7/12, SRP, Jo-1, Ku, Mi-2	2 (66.6)	1 (33.3)
	ELISA	Ro-52, PM/Scl		

Results

- 18 of 80 patients (22.5%) had commercial myositis panels performed within one year of sera collection
- Majority of patients were female (94.4%) and Caucasian (88.9%) (**Table 1**)
- Median time from date of commercial lab to date of sera collection was 73.5 days (IQR 27.3 – 128.8 days)
- Most labs performed by ARUP (n = 6) and Quest laboratories (n = 6) (**Table 2**)
- ARUP labs had the greatest discordance rate (50%) (**Table 2**)
  - Ro-52 (1 false positive, 1 false negative)
  - TIF1-γ (1 false negative)
- Immco Diagnostics had one discordant value (OJ, false negative)
- While Quest and RDL had 100% concordance they did not test for all antibodies
  - Did not test for: Ro-52, TIF1-γ, PM-Scl, SAE1, NXP-2, MDA-5
  - Likely result of test ordering, not necessarily laboratory capability

Conclusions

- Discordancy of results and limited testing contribute to the discrepancy between commercial myositis panels and research lab myositis panels
- Factors contributing to discordancy include
  - Different modalities among different commercial panels
  - Limited standardization/calibration of commercial assays
  - Change in disease status over time
- Myositis panels need to be both accurate and extensive to make a meaningful impact on the diagnosis and treatment of DM.
- Physicians should be aware of the antibodies tested and the limitations of commercial labs when ordering myositis panels

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