PP18 Red Flags For The Early Diagnosis Of Rare And Complex Connective Tissue And Musculoskeletal Diseases

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Introduction: In collaboration with a European Reference Network for rare diseases, we aimed to identify red flags for the diagnosis of rare and complex connective tissue and musculoskeletal diseases (rCTDs). Some indicators, presented as red flags, might raise clinicians' awareness about the presence of rCTDs. Their identification is critical in primary care, where they are most likely to be first observed.
Methods: Firstly, we conducted a scoping review to identify red flags already published in the scientific literature. We included studies about people with rCTDs that described red flags, warning signs, alarm symptoms, and pathognomonic signs identifiable in a primary care setting. Then, we conducted a systematic review of evidence pointing out which signs and symptoms should arouse suspicion specifically for IgG4-related disease. We included studies providing estimates of diagnostic precision or prevalence of signs and symptoms, and we assessed their quality and applicability to the review question. We conducted systematic searches in major medical databases and manual searches in rare disease resources.
Results: For the scoping review, 49 studies out of 1,656 records met the inclusion criteria. Two reported red flags for autoimmune diseases altogether, and 14 described red flags for systemic sclerosis. For the systematic review, seven studies out of 4,477 records met the criteria, comprising five diagnostic precision studies and two large case series. These were generally rated as having a high risk of bias and were included as indirect evidence. We identified 32 potential IgG4-related disease red flags, 10 related to clinical history findings and basic signs or symptoms, and eight belonging to common laboratory findings and basic imaging techniques.
Conclusions: Red flags for rCTDs have generally been established through expert consensus and lack valid indicators for diagnosis, such as sensitivity, specificity, or predictive values. They frequently overlap among different rCTDs. Potential red flags are prone to change as further evidence emerges. This shows the need to collaborate with reference networks to address rare diseases where the evidence is still scarce.

PP19 Time And Cost Savings Of Machine Learning And Artificial Intelligence (AI) In Systematic Reviews: A Case Study

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Introduction: Conducting a systematic review (SR) of clinical trials is labor-intensive and expensive. However, existing open-source content can be used to develop custom machine learning tools suited to the workflow of individual organizations. This case study details the potential of a bespoke tool developed by York Health Economics Consortium (YHEC) for reducing the time and cost involved in producing an SR.
Methods: RESbot is a flexible, stand-alone machine learning tool created using an extensively tested open-source dataset developed by Cochrane. The tool identifies randomized controlled trials (RCTs) from a large corpus of records. It has a user interface and inputs/outputs to fit into the company's existing workflow at any stage. RESbot has two settings. The "sensitive" setting identifies a higher number of possible RCTs with a lower risk of missing eligible studies, while the "precise" setting is more focused. For both settings, we estimated the reduction in resources required for record screening in two examples of RCT-only reviews.
Results: Scoping searches in MEDLINE were conducted for SRs of RCTs in femoropopliteal artery diseases (FAD) and postpartum depression (PD). The results were run through RESbot. For the FAD SR, 1,444 references were retrieved, with the sensitive and precise RESbot settings reducing the record set by 38 percent and 64 percent, respectively. For the PD SR, a record set of 2,153 records was reduced by 25 percent and 41 percent, respectively. Resource savings offered by RESbot vary depending on subject but may reduce the time taken to screen records by up to 64 percent, with a subsequent reduction in cost to the organization commissioning the SR.
Conclusions: The use of bespoke machine learning tools in SR production has the potential to reduce the time and staff costs involved in producing a review. This case study tested the effect on a small number of records, but for larger reviews retrieving tens of thousands of records, reductions in time and costs can be very significant.

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