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Red Flag Screening for Low Back Pain

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ABSTRACT

INTRODUCTION: *Screening for red flags in individuals with low back pain (LBP) has been a historical hallmark of musculoskeletal management. Red flag screening is endorsed by most LBP clinical practice guidelines, despite a lack of support for their diagnostic capacity. There are four major reasons why red flag screening is not consistent with best practice in LBP management: (1) clinicians do not actually screen for red flags, they manage the findings; (2) red flag symptomology negates the utility of clinical findings; (3) the tests lack the negative likelihood ratio to serve as a screen; and (4) clinical practice guidelines do not include specific processes that aid decision-making.*

METHODS: *Narrative review, using clinical experience and comprehensive literature reviews to compile the recommendations.*

CONCLUSION: *Based on the findings, the authors propose that clinicians consider: (1) the importance of watchful waiting; (2) the value-based care does not support clinical examination driven by red flag symptoms; and (3) the recognition that red flag symptoms may have a stronger relationship with prognosis than diagnosis.*

ANALYSIS

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Background Information

Diagnosis remains a necessary and important component of patient care and, despite training, background or philosophy, clinicians who treat low back pain (LBP) use differential diagnostics to improve the likelihood of providing the appropriate care to the patient. Among the differential diagnostic techniques generally employed by clinicians is screening for potentially significant conditions, first termed red flag screening by Berry (1). Berry was a proponent of preliminary screening for signs or symptoms related to serious underlying pathology, suggesting that identification of such red flags was valuable in that it may indicate the need for more diagnostic testing before treatment is delivered. Ninety years after Berry suggested their use, researchers have concluded that screening for red flags associated with low back pain does not work. In this review, the authors outline where this process is lacking and offer alternatives to consider in the future of low back pain management.

Summary:

The authors propose the following reasons why red flag screening does not work:

Reason 1: red flag symptoms neither rule out nor identify serious pathology

The likelihood ratio (LR) of a test ruling in or out a condition is calculated using the sensitivity and specificity values from a contingency table. A negative LR (-LR), or the probability of a person who has a disease and tests negative over the probability of a person who does not have a disease testing negative, is used to rule out a condition, with the strength of the finding increasing as the -LR approaches 0. Conversely, a +LR, or the probability of a person who has a disease and tests positive over the probability of a person who does not have a disease testing positive. The +LR rules in a disease or condition, with a higher +LR (i.e. closer to 1.0) more strongly ruling a condition in. The value of these indicators; however, is minimal. In a meta-analysis, Downie et al. (2) demonstrated that tests for red flags are insufficient in ruling out a condition via negative findings. Similarly, Williams et al. (3) tested red flag screening for vertebral fracture in LBP patients and found that the post-test probability for ruling out fractures improved by less than 1% when a negative finding on red flag testing occurs.

Reason 2: variability in definitions for red flag symptoms greatly limits research and clinical progress in this area

Due to the low prevalence of serious conditions, studies evaluating symptoms and tests for red flags are very difficult to conduct, owing to the prohibitively large sample sizes that are required when properly powering studies. As a result, inconsistency in the assessment of red flags continues. In a systematic review attempting to identify types of red flag symptomatology (4), 97 unique items representing symptoms from eight body systems were identified, with 10 items needed to identify a red flag responder with 94.7% accuracy

and 23 items required to identify with 100% certainty. This variability limits the ability of red flag screening to properly identify underlying conditions.

Reason 3: LBP guidelines do not help

The vast majority of guidelines for treatment of low back pain endorse the use of red flag screening for determining the presence of spinal fracture or malignancy (5). However, an overview of guidelines for non-specific LBP revealed 8 guidelines endorsing 27 red flags for malignancy and 26 for fracture, although none of the 8 guidelines endorsed the same set of red flags (6). As such, no stable nor consistent set of rules exists for clinicians to use to identify possible underlying conditions. Additionally, the use of traditional red flags for imaging (age < 45, night/morning pain, family history, etc.) can lead to significant overuse of imaging and potentially inappropriate clinical reasoning (7).

Reason 4: clinicians do not actually screen for red flags; they manage LBP conditions they see

Medical screening seeks to identify signs and symptoms of a condition in an asymptomatic patient population, while diagnostic testing involves clinical procedures to aid in the detection or diagnosis of a suspected disease or condition. Low back pain is itself a symptom of an underlying condition and not a diagnosis. It is not affiliated with a serious pathology and will often exhibit symptoms similar to competing diagnoses such as fracture or cancer. Many red flags associated with LBP are more prevalent in an older population, which also frequently have concomitant orthopaedic-related LBP (8). Indeed, a definitive set of signs and symptoms that are unique to serious pathology of the low back has not been identified, whether for screening or diagnostic purposes.

CLINICAL APPLICATION & CONCLUSIONS

The authors offer 3 recommendations regarding testing for red flags:

1. *Watchful waiting:* rather than ordering early diagnostic testing, clinicians are encouraged to use watchful waiting, or the act of close surveillance, while allowing time to pass before initiating medical intervention. Early testing may, in fact, be detrimental to patients with LBP (9). As well, early detection may increase the incidence of several diseases but for many, the mortality rate remains unchanged (10). As such, the usefulness of early detection may not be justified. The authors recommend careful monitoring of symptoms, watching for changes over time.
2. *Value-based care:* the costs associated with the episode of care for LBP can escalate rapidly when diagnostic imaging such as MRI are incorporated, which can significantly affect the value-based aspects of care. The authors advocate for the careful use of such tests and recommend adopting careful consideration of value-based care before ordering expensive and potentially unnecessary tests.

3. *Link red flag testing with health status rather than diagnostic testing*: up to 94% of patients presenting to a general practice will present with abnormal MRI findings, while only 3% are likely to have an underlying serious pathology (11). In fact, the serious condition most likely to be present in this population is vertebral fracture, for which there are reliable clinical tests. Linking tests to the patient's health status, rather than potential red flags, could lead to a decrease in the use of diagnostic imaging, and an overall improvement in the episode of care.

STUDY METHODS

The authors presented a narrative review, using clinical experience and comprehensive literature reviews to compile their recommendations.

STUDY STRENGTHS/WEAKNESSES

Strengths:

- Comprehensive review making good use of clinical guidelines, systematic reviews and relevant clinical evidence.
- The author group has strong and relevant clinical experience.

Weaknesses:

- As this was a narrative review, the authors were not able to pool data to help support findings or recommendations.

Additional References:

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