The Gait, Arms, Legs & Spine (GALS) Exam: An Effective Screening Tool for Rheumatoid Arthritis When Used by Family Physicians and Nurse Practitioners

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ABSTRACT

Objective: to evaluate the sensitivity and specificity of the GALS (gait, arms, legs & spine) examination when used by family physicians and nurse practitioners to screen for signs and symptoms of rheumatoid arthritis (RA).

Methods: Participating healthcare professionals (HCP), including 2 rheumatologists, 3 family doctors (FDs) and 3 nurse practitioners (NPs), were trained to perform the GALS exam and record their findings by viewing an instructional GALS DVD and attending a hands-on training workshop. One week after training, HCP performed the GALS on 41 study participants recruited through local rheumatology practices. Twenty participants had previously been diagnosed with RA while the remaining 21 participants had never been diagnosed with RA. Study participants were divided into two groups (A & B) such that approximately half of the participants in each group had RA. Those in Group A were assessed by 1 rheumatologist, 1 FD and 2 NPs while those in Group B were assessed by 1 rheumatologist, 2 FDs and 1 NP. HCPs recorded gait abnormalities, abnormalities of the movement or appearance of the arms, legs and spine and, ultimately, whether a diagnosis of RA was suspected. HCP were blinded to the medical history of the participants and were unaware that half of the study participants had previously been diagnosed with RA. HCP were told that the primary objective of the study was to investigate their level of agreement regarding findings on the GALS exam. Sensitivity and specificity were calculated for each HCP to determine the ability of the FDs and NPs to screen for RA signs and symptoms using the GALS when compared to the rheumatologists' screen on the study day.

Results: When compared to the rheumatologists' screening of RA, sensitivity for each of the 3 FDs was 60%, 80% and 100% while the specificity for each was 82%, 82% and 70%, respectively. Sensitivity for each of the 3 NPs was 60%, 80% and 90% while the specificity was 100%, 80% and 73%, respectively.

Conclusions: These results suggest that the GALS exam may be a useful screening tool for RA when used by FDs and NPs working in the primary care setting. Differences in level and type of clinical experience may contribute to the variations observed. The merits of introducing the GALS exam into primary care curricula should be explored.

BACKGROUND

- For optimal RA management, best practice guidelines emphasize early referral to a rheumatologist when potential cases are suspected (1-3).
- Although early referral is critical (5), recognition of signs and symptoms of rheumatoid arthritis in primary care remains a major challenge (6).
- Evidence suggests that such MSK conditions are significantly under-detected or under-diagnosed in primary care (6-9).
- Lack of training on MSK conditions by General Practitioners has been cited as the major factor for delay in appropriate diagnosis and treatment (9).
- There is a need for a simple screening tool to improve the recognition of potential cases of early inflammatory arthritis (6, 10-12).
- The **Gait, Arms, Legs, and Spine (GALS)** screening exam is a three minute exam consists of three questions, a gait assessment and examination of the appearance and movement of the arms, legs, and spine.
- This tool may enable primary care healthcare professionals to identify signs and symptoms of systemic inflammatory arthritis

- **HYPOTHESIS:** The GALS exam can taught to family physicians and nurse practitioners and employed by them in the primary care setting to screen for patients with RA.

METHODS

PARTICIPANTS (target n=50, actual n=41))
- ✓ 25 participants with RA recruited from two rheumatology practices. Treating rheumatologists were not involved in study.
  - Diagnosed with RA (ACR criteria)
  - ≥50 years of age
  - early or mild disease
- ✓ 25 individuals WITHOUT RA randomly selected from one of the aforementioned rheumatology practices.
  - No inflammatory arthritis (OA allowed)
  - ≥50 years of age
- ✓ The time elapsed between recruitment of all study participants and the study day was approximately two months.

HEALTHCARE PROFESSIONALS (n=8)
- 2 rheumatologists (considered "gold standard")
- 3 family physicians
- 3 nurse practitioners

Group A:	Group B:
1 rheumatologist	1 rheumatologist
1 family physician	2 family physicians
2 nurse practitioners	1 nurse practitioner
9 RA patients	9 RA patients
11 non-RA patients	12 non-RA patients

- Healthcare professionals attended a 3-hour training workshop which included reviewing the instructional GALS DVD, watching a demonstration of the GALS exam on a volunteer, and practice sessions on 2 individuals with RA.

- On the study day, each participant was assessed by four healthcare professionals.
- All healthcare professionals and investigators were blinded to participants' health status (RA or no RA) and previous medical history.
- Testing occurred at the primary health clinic one week after the training workshop.

METHODS (CONT'D)

- Healthcare professionals rotated from one exam room to the next to assess participants.
- Each healthcare professional had 6 minutes to evaluate abnormalities of the gait, arms, legs and spine (Table 1) and record them as normal or abnormal.
- If/when an abnormality was observed, healthcare professionals recorded the specific location (e.g. left hand) and type (e.g. Heberden's nodes) of abnormality.
- They also documented if RA was suspected.
- After each assessment, healthcare professionals handed in their recording sheet before moving to the next participant.

- Analyses assessed the sensitivity and specificity of the GALS exam to screen for RA.
- The observations of each family physician and nurse practitioner were compared with those of the rheumatologist in their group; specifically whether or not a query of RA was documented on the record sheet.
- Sensitivity, specificity, and likelihood ratios were calculated using the standard definition and the VassarStats website.

Table 1: Individual features assessed in the GALS exam

GAIT		• Symmetry & smoothness of movement • Ability to turn normally & quickly
ARMS	Hands	• Wrist/finger swelling/deformity • Squeeze test across 2nd-5th metacarpals*
	Grip Strength	• Power & precision of grip
	Elbows	• Full extension
	Shoulders	• Abduction & external rotation of shoulders
LEGS	Feet	• Squeeze across metatarsals for tenderness (synovitis)*
	Knees	• Knee swelling/deformity, effusion • Quadriceps muscle bulk
	Hips	• Internal rotation of hips
SPINE	Rear Inspection	• Shoulders and iliac crest height/symmetry, Scoliosis
	Front Inspection	• Lateral C-spine flexion – ears against shoulders • Joints and rotator cuff muscles – hands behind head
	Side Inspection	• Normal thoracic and lumbar lordosis • Normal cervical kyphosis
	Trigger point tenderness	• Supraspinatus muscle tenderness (exaggerated response)

RESULTS

- 41 study participants were examined on the study day (Table 2). 9 participants did not show due to illness or scheduling conflicts.
- In both Group A and Group B, the rheumatologists detected signs/symptoms of RA in 8 of 9 participants (89%).

Table 2: Sensitivity, specificity and likelihood ratios for assessment of RA symptoms/signs compared to Rheumatologists' assessment on study day

Healthcare Professional	Sensitivity (%) (95% CI)	Specificity (%) (95% CI)	(+) Likelihood Ratio (95% CI)	(-) Likelihood Ratio (95% CI)
Group A				
Family Physician	100	70 (42 to 98)	3.33 (1.29 to 8.59)	N/A
Nurse Practitioner	80 (55 to 100)	80 (55 to 100)	4.00 (1.11 to 14.35)	0.25 (0.07 to 0.90)
Nurse Practitioner	60 (30 to 90)	100	N/A	0.40 (0.19 to 0.85)
Group B				
Family Physician	60 (30 to 90)	82 (59 to 100)	3.33 (0.85 to 12.75)	0.49 (0.22 to 1.10)
Family Physician	80 (55 to 100)	82 (59 to 100)	4.40 (1.21 to 16.01)	0.24 (0.07 to 0.87)
Nurse Practitioner	90 (71 to 100)	73 (46 to 99)	3.33 (1.23 to 8.85)	0.14 (0.02 to 0.91)

CONCLUSIONS

- We believe this to be the first study to investigate the use of the GALS examination involving nurse practitioners and examining its utility in screening for signs and symptoms of Rheumatoid Arthritis.

- Both sensitivity and specificity for NPs and FDs were generally good and suggest that healthcare professionals working in primary care may be able to implement the GALS exam to improve detection of RA.

- LR's will apply to similar settings regardless of the prevalence of RA which would be expected to be lower in a primary care setting

- Study limitations: a) only 1 training session, b) dropout rate of study participants (22%), c) absence of initial assessment of abilities of FDs and NPs to detect RA signs and symptoms, d) may not be generalizable to non-academic family practice clinics

- The merits of introducing the GALS exam into curricula for Nurse Practitioners should be explored.

- A study investigating the post-study use of the GALS exam in clinical practice may be beneficial.

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