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Dates: Received: 25 January, 2017; Accepted: 06 February, 2017; Published: 07 February, 2017

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Keywords: Referral and consultation; Public health administration, Rheumatology

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Research Article

Proposal for an Urgency Score as General Referral Strategy to Second-Care Rheumatology

Abstract

Objectives: To assess the practicability of a questionnaire to routinely discriminate between urgent and non-urgent rheumatology appointments by administrative personnel. Second, to discuss the results in view of current literature on referral strategies of rheumatic patients from primary to secondary care, including those with immune-mediated rheumatic diseases.

Methods: In our rheumatology unit a rheumatology urgency score (RUS) is calculated on the basis of a multi-dimensional questionnaire with five main domains: Administrative information (referral mode, subjective urgency), clinical signs, time of maximal symptom presentation, available laboratory and imaging findings. This RUS has been routinely used by administrative personnel and nurses since July 2013 for assigning appointments at initial consultation, with urgency defined as $RUS \geq 4$ points. Anonymous score sheets including the time until appointment assignment were retrospectively analyzed. A literature search was performed with last update in January 2015 to identify previous evidence for effective strategies reducing waiting times and underlying causes for prolonged waiting times.

Results: Consecutive questionnaires from 153 patients were analyzed, with $RUS \geq 4$ points considered as urgent for 75% of the patients ($n = 115$). Based on the bimodal distribution curve of waiting times, the total cut-off between short and long waiting times was defined as 23 days. Mean waiting time for urgent patients was shorter with 14.4 days (± 13.1 days), than for non-urgent appointments with 24.6 days (± 15.4 days) ($p < 0.001$). 27.5% of all appointments were assigned independently from RUS, with 40.5% of questionnaires with $RUS < 4$ resulting in a fast appointment and 16.1% of questionnaires with $RUS \geq 4$ points resulting in a slow appointment. Without these incorrect assignments, waiting times were shorter for urgent than for non-urgent patients with 8.6 and 38.0 days, respectively ($p < 0.001$). Administrative information, clinical signs, time of maximal symptom presentation, laboratory and imaging findings were available in 99.3%, 94.1%, 77.1%, 33.3%, and 17% of the questionnaires, respectively.

According to the literature, effective strategies resulting in a reduction of referral delay are rapid access services, early arthritis clinics, triage of referrals with use of referral forms and educational programs for primary care physicians. A general strategy for all patients including those with immune-mediated rheumatic diseases like RUS has not been presented so far.

Conclusion: The rheumatology urgency score resulted in a bimodal distribution of waiting times, thus distinguishing between urgent- and non-urgent appointments. To achieve better quality in differentiation of urgent appointments, administrative personnel and nurses have to be further instructed and motivated. In the future, RUS has to be further validated in a prospective approach taking into account the subjective and objective physicians' feed-back of urgency and final diagnoses.

Introduction

General practitioners (GPs) are considered as gatekeepers and first-line providers for specialized medicine [1,2]. Referring preselected patients to specialists is one of the key tasks of GPs to ensure an optimal clinical care. Only recently, interventions to improve referrals from primary to secondary care have been

reviewed by the Cochrane initiative [3]. The authors' conclusion from seventeen studies (involving 23 different interventions to improve referral practice) is, that both structured referral sheets and active local educational interventions have been shown to be helpful interventions resulting in improved referral quality. Improved referral quality should result in earlier referral of patients with urgent need of an appointment.

From the rheumatological perspective GPs refer patients to secondary care because of severe musculoskeletal symptoms or in suspected inflammatory but non-infectious conditions. For most of these diseases, evidence clearly endorses early treatment to prevent organ damage like erosive and destructive joint disease in rheumatoid arthritis [4,5], or reduce pain to increase life quality. However, referral times from GPs to specialists are often delayed, and even the concept of immediate access clinics as provided for early arthritis by some centers [6], cannot be realized in all clinics and does not necessarily cover the wide range of rheumatic diseases (including inflammatory and non-inflammatory musculoskeletal diseases, vasculitides and other systemic diseases). Overall, long waiting lists in many rheumatic services show that there is a definite need for preselection of urgent patients for early referrals by GPs [7].

Most referrals to rheumatologists were considered appropriate in a UK study in 2005 (94%) [8]. In an Irish study already referral letters and basic investigations helped to prioritize appointments for rheumatology clinics [9], but little is known about easily applicable referral systems to support administrative staff in preselection of rheumatology patients for earlier appointments. Only one unspecific referral strategy used health-related quality of life (HRQoL) as determined by the Rosser Index to distinguish between urgent, ordinary and work disability appointments. Those patients with the lowest HRQoL were more likely referred to secondary care within 3 working days than those with better HRQoL [10] and the authors recommend prioritization of patients with low HRQoL, who may receive more benefit from early access. Other referral strategies cover early arthritis, crystal arthropathies, osteoarthritis and spinal pain syndromes [11], but not the whole spectrum of rheumatic diseases to be referred to a rheumatology specialist clinic.

Since July 2013 a rheumatology urgency score (RUS) as a standardized questionnaire has been used in our rheumatology outpatient unit to support and standardize decisions on urgent appointments by untrained secretaries and nurses of the rheumatology outpatient clinic of the university hospital of Innsbruck. The items had been selected earlier by an experienced rheumatologist. The a-priori-validity of a questionnaire was considered superior to lack of any specific training. This retrospective analysis of consecutively collected, but anonymous questionnaires was performed as a quality initiative to get first experiences with such a tool. Second, current literature on referral strategies of rheumatologic patients to a secondary/tertiary care center was summarized to discuss the possible value of the questionnaire in view of current literature on referral strategies of rheumatic patients.

Methods

This is a retrospective analysis of subsequent anonymous questionnaires filled out by medical staff in clinical routine. As such it is considered as a quality assurance initiative, to increase the awareness and optional documentation of facts supporting the referral decisions.

Questionnaire and rheumatology urgency-score

The RUS includes several relevant elements from five main domains: (1) Administrative information, (2) clinical signs, (3) time of maximal symptom presentation, available (4) laboratory and (5) imaging findings. One or 2 urgency points were considered depending on importance of items, and added to the total RUS.

- 1. Administrative information:** Administrative data included the person requesting the appointment (patient, relative or physician) and the request mode (in person or by phone), the kind of referrer/referring physician (self-referred, GP, specialist, outpatient clinic, inpatient clinic or other clinics) and urgency of consultation (normal, urgent or emergency). A maximum of two points was assigned depending on the referrer and subjective urgency, resulting in a possible maximum of four points for administrative elements.
- 2. Clinical signs:** One urgency point was assigned for each of the following clinical signs: Joint swelling, lower back pain (symptom onset before the age of 45), psoriasis, myalgia, severe xerostomia / xerophthalmia, temporal cephalgia, jaw claudication and oral/genital aphthae. Two points were assigned for uveitis / iritis, colitis or bilateral shoulder girdle pain after the age of 50 years.
- 3. Time of maximal symptoms' presentation:** One urgency point was assigned for maximal presentation of symptoms in the morning, at night or both in the morning and at night. Other time points were not considered.
- 4. Laboratory findings if available.** Patients were asked for available laboratory findings with a possible maximum of two points assigned for elevated erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), rheumatoid factor (RF) or cyclic-citrullinated peptide antibodies (CCP), presence of human leukocyte antigen B-27 (HLA-B27), antinuclear antibodies (ANA) or anti-neutrophil cytoplasmic antibodies (ANCA).
- 5. Imaging findings, if available:** Only pre-existing x-ray findings compatible with rheumatoid arthritis, articular gout, calcium pyrophosphate dehydrate crystal deposition disease (CPPD), spondyloarthritis including ankylosing spondylitis or vasculitis were assigned with one urgency point. Imaging was not routinely recommended before providing the appointment.

After survey-completion assigned urgency points were summed up resulting in a rheumatology urgency score (RUS) with a possible maximum of 11. Administrative personnel was advised to give an urgent appointment for patients with four points or more, while the other patients with three points or less should receive appointments within the normal track.

Setting and collection of questionnaire-forms

Referral to urgent appointments was unstructured until the questionnaire was introduced. Using the questionnaire

should facilitate the decisions on urgent appointments by untrained secretaries and nurses (Figure 1). Data are inquired personally or by phone at the initial consultation regardless of the contacting person (patient, referring physician, etc.). Questionnaires also include date of performance and date of appointment. All consecutive questionnaires were used for this retrospective analysis.

Data, statistical and ethical considerations

Anonymously used questionnaire forms were provided by administrative staff of the rheumatology outpatient clinic. Evaluators were unaware of diagnoses and patient's clinical data. Data were collected in an excel file (Microsoft Excel 2013, Redmond, WA: Microsoft) and statistical analyses were performed in SPSS (IBM SPSS Statistics for Windows, Version 20.0, Armonk, NY: IBM Corp). Data were tested for normal distribution using the Shapiro-Wilk test, Mann-Whitney-U test for comparison and Spearman's rho for correlation of data. If not described differently, all appointments were used for data evaluations.

As this is a retrospective analysis of anonymous questionnaires, the effort was considered as a pure quality initiative. As patients were not directly involved, the local ethics committee was not involved.

Literature search

The search was performed for literature published until 1/2016 using Medline (Pubmed), Pubmed Central and the Cochrane Library databases. The search included following keywords: rheumatol*, outpatient clinic, waiting time and referral delay. Only English literature was screened for, and duplicates were removed. Additional studies were selected if referenced in one of the selected manuscripts.

Results

Administrative characteristics

Questionnaires with score calculations were used by administrative staff of the rheumatology outpatient clinic

of the Medical University of Innsbruck for 153 appointments within 9 months (July 2013 to March 2014). Out of these 64.4% (n = 76) of the appointments were requested by patients, 22.0% (n = 26) by clinics or medical practices and 13.6% (n = 16) by relatives (with request data not available for 35 questionnaires). Administrative personnel collected data by phone for 96.3% (n = 77) and 3.8% (n = 3) through personal interviews (with missing data in a total of 73 questionnaires).

Appointments were sought after referral by GPs in 71.2% (n = 109), by outpatient clinics in 9.2%, by specialists in 8.5%, by self-referral in 6.5% and by other inpatient clinics in 1.3% of the patients. 3.3% of the patients were not assessed. Consultations were reported as urgent in 46.4% (n = 71) and as emergency in 2.6% (n = 4) of patients. Non-urgent consultations were reported in 51.0% (n = 71) including missing data regarding urgency of consultation.

Patients' history assessed by administrative personnel

Clinical signs, time of maximal symptoms' presentation, available laboratory findings and imaging findings were indicated in 94.1%, 77.1%, 33.3%, 17.0% of the questionnaires, respectively.

Out of the clinical signs joint swelling was reported in 68% (n = 104), lower back pain or psoriasis in 33.3% (n = 51), uveitis or inflammatory bowel disease in 2.4% (n = 4), myalgia in 25.5% (n = 39), bilateral shoulder girdle pain in 13.1% (n = 20) and at least one of the rare symptoms (including severe xerostomia / xerophthalmia, temporal cephalgia, jaw claudication or oral / genital aphthae) in 6.5% (n = 10).

Time of maximal symptoms' presentation were available for 77.1% of the patients. Out of these 23.5% (n = 36) had a maximal symptom presentation in the morning, 12.4% (n = 19) at night and 15.0% (n = 19) both in the morning and at night. 26.2% (n = 40) reported other times of maximal symptom presentation (atypical or the whole day). Maximal symptom presentation was not assessed in 22.9% (n = 35).

Laboratory findings were available for 33.3% (n = 51) of questionnaires. One urgency point was assigned for 17.0% (n = 26) of the patients for pathological findings in ESR (< 40 mm / hour), CRP, RF, anti-ccP, HLA-B27, ANA or ANCA. Two urgency points for an ESR > 40mm / hour were assigned for 1.3% (n = 2) of questionnaires.

X-ray findings were available for 17.0% (n = 26) of the questionnaires. Out of these 9.8% (n = 15) were assigned with one urgency point due to compatibility with rheumatoid arthritis, articular gout, calcium pyrophosphate dehydrate crystal deposition disease (CPPD), spondyloarthropathy including ankylosing spondylitis, or vasculitis.

Score-based two-peaked waiting times for specialists' appointments

The sum of assigned urgency points resulted in 75.0% of the patients (n = 115) with a calculated RUS of greater or equal four, whereas 25.0% (n = 38) had a score of three or less.

RUS - SCORE REGISTRATION (+1 point, +2 points) - Please fill out completely!

Registration patient relative doctor's office/clinic via phone in person
Initial examination patient seen by rheumatologist before, last visit: _____

Referred by self general practitioner specialist out-patient clinic in-patient, hospital ward

Rated urgency rheumatologic emergency urgent normal

Physical complaints swollen joints (at least one thick joint - but not both ankles swollen in late afternoon!) OR lower back/sacroiliac pain (insidious onset, age at onset <45) OR psoriasis OR uveitis / iritis OR colitis OR muscular pain OR bilateral shoulder pain after age of 50 OR Fever > 38°C, severe headache > impaired vision > jaw claudication > aphthae/oral ulceration

Severest (maximal) physical complaints at night AND/OR in the morning (NOT at noon AND/OR in the evening!) +1

Pre-diagnosis for patient, parents, siblings or children rheumatoid arthritis, psoriatic arthritis, spondylarthritis/ankylosing spondylitis, lupus/vasculitis +1

Laboratory tests erythrocyte sedimentation rate _____ mm/1st hour (if >40, if abnormal) OR C-reactive protein/CRP _____ (normal up to _____) (if abnormal) +1 +2

Laboratory tests rheumatoid factor / ACPA negative positive (only in combination with swollen joints - see above) OR HLA-B27 negative positive OR ANA (also SS-A, Jo1 etc.) OR ANCA negative positive +1

Imaging results available, consistent with/typical for rheumatoid arthritis, gout/CPPD, spondylarthritis/ankylosing spondylitis, vasculitis +1

APPOINTMENT-SCORE: summarize score points, acute appointment usually assigned in case of 4 or more points

Initials: _____ Date of registration: ____/____/____ Appointment: ____/____/____
Date of birth: ____/____/____ Signature: _____

Sum-Score: _____

Figure 1: English version of the questionnaire as used in the rheumatology outpatient clinic of Clinic VI, Internal Medicine at the Medical University of Innsbruck.

In this setting, RUS had a clear effect on waiting times (Figure 2). Waiting times for urgent and non-urgent appointments were significantly different ($p < 0.001$). Patients with calculated RUS greater or equal four had a mean waiting time of 14.4 days (± 13.1 days), whereas patients with a RUS of three or less had a mean waiting time of 24.6 days (± 15.4 days), resulting in a bimodal distribution of waiting times until consultations (missing data for 10 questionnaires, 6.5%) (Figure 2). Based on the bimodal distribution curve of waiting times, the cut-off between short and long waiting times was defined as 23 days. 69.7% ($n = 106$) of the patients waited shorter than 23 days, and 30.3% ($n = 46$) of the patients longer than the cut-off. Bimodal waiting time distribution with weekly intervals (and spline interpolation line) showed clearer distribution curves for waiting times of those patients correctly assigned to urgent and nonurgent appointments ($n = 111$) (Figure 3a) compared to those curves for waiting times of all patients ($n = 153$) (Figure 3b).

Taken together, 27.5% of all appointments were assigned independently of RUS. 16.1% ($n = 17$) of the patients with 3 or less urgency points were falsely given an urgent appointment. Besides, 54.4% ($n = 25$) of the 46 patients with waiting times longer than 23 days should have been assigned an urgent appointment. Only 83.9% ($n = 89$) of the 115 patients with urgent appointments had more than 3 urgency points and thus were correctly assigned as urgent. Without these incorrect assignments, waiting times were shorter for urgent than for non-urgent patients with 8.6 ± 5.8 and 38.0 ± 6.3 days, respectively ($p < 0.001$).

Item-specific evaluations of waiting times for specialists' appointments

The number of RUS points for single pathologic findings was low. Nevertheless, a tendency was observed that patients with specific clinical signs and reported typical positive findings at referral time were assigned earlier appointments. For uveitis/inflammatory bowel disease and for imaging findings, the waiting times are depicted in Figure 4a and 4b. Patients with reported positive imaging findings had a higher calculated RUS ($p = 0.012$) resulting in an urgent appointment. Reported clinical signs of uveitis / iritis or colitis did not show significant

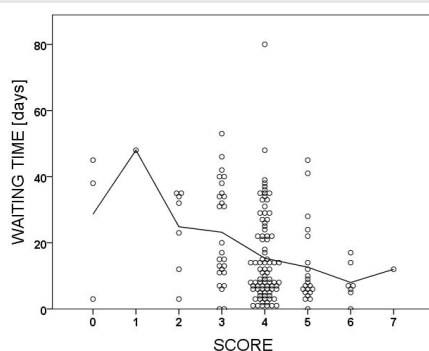


Figure 2: Distribution of waiting times according to calculated Rheumatology Urgency Scores (RUS). Higher RUS-scores were more likely to result in urgent appointments with shorter waiting times ($\rho = -0.32$, $p < 0.001$). Mean waiting times were 15.3 days for RUS = 4, 12.6 days for RUS = 5, and 8.0 days for RUS = 6.

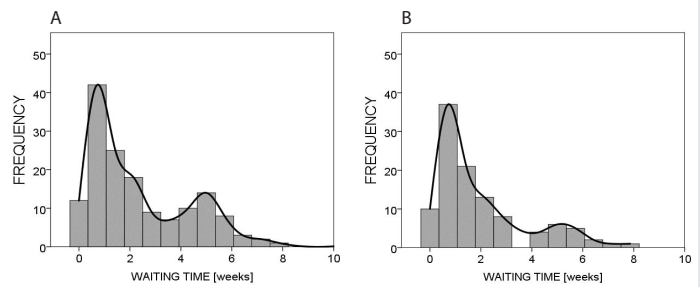


Figure 3: Waiting time distribution for (A) all patients compared to (B) those who were correctly assigned.

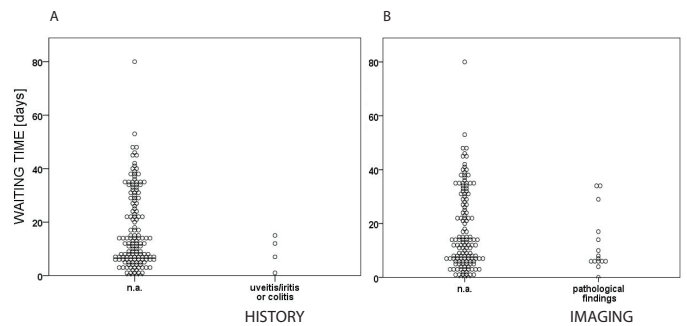


Figure 4: Distribution of waiting times for patients with (A) history positive for uveitis / iritis or colitis (not significant) and (B) reported pathological imaging results ($p = 0.012$) at time of referral. n.a., not applicable (as unknown to referring person).

differences in RUS. Patients with uveitis / iritis or colitis and reported positive imaging findings had shorter waiting times of 8.8 days and 12.5 days, respectively, compared to all urgent appointments with mean waiting times of 14.4 days and 24.6 days for non-urgent appointments.

Literature search

A total of 12 papers were selected by the literature search performed as outlined in Figure 5. Results are summarized in Table 1. In summary, strategies studied to reduce waiting times for a rheumatological appointment were based on implementation of a unspecific triage system [7], a consultancy program [12] and an immediate access clinic (IAC) [6] or systematic search for reasons responsible for delayed consultations [13–15]. Out of these the rapid access service [6], early arthritis clinic [16], triage of referrals with use of referral forms [7] and educational programs for primary care physicians and health professionals [12] were shown to be effective interventions resulting in reduction of referral delays. Educational programs for the patients, such as informative websites, did not show efficiency [17].

In general, lag of referring time between the initial health care provider and a specialist was more important for the delay of first diagnosis than any delay caused by the patients themselves [13,15]. As contributors for patient-related delay, others identified patient's ethnicity, age and symptom-associated delay [14,18]. Patients with delayed medical seeking behavior had a gradual onset of symptoms in contrast to patients with earlier consultation with prompt onset of symptoms [16]. Factors associated with prompt consultation

Table 1: Summarized results of the literature search (ordered according to number of patients/charts used)

References	Trial design	Patients, charts etc.	Objective	Fast track/ ordinary appointments	Referral/ reduction in waiting time/ Results
Systematic literature review					
[17]	1985-2010	47 articles	Identify strategies promoting early referral and reducing delays in diagnosis and management of IA	32 articles about strategies for early identification / improved referral, 15 articles about reducing referral delays, 19 articles about referral delay GP to specialist	Identified strategies increasing referral or reducing referral delay: Rapid access services, early arthritis clinics, triage of referrals and referral forms and education programs (GPs). Ineffective: Internet, self-administered questionnaires, website education, information
Prospective Studies					
[7]	2009-2011	Case-Control	3.476	Compare waiting times before and after unformal triage	Waiting times for routine: 83.0 days, soon 29.0 days, urgent 6.0 days Waiting time for rheumatoid arthritis reduced by 50% after implementing the triage system (50 to 25 days)
[12]	2003-2004	Observational	1141	Determine influence of GP consultancy program	Waiting time diminished from 7 to 1 month, waiting list reduced from 790 to 51 patients Diminished referral rates with reduced waiting times with primary care consultancy program
[6]	2009	Observational	1036	Constitute IAC to reduce waiting times / facilitate access to rheumatologist	Lag time between referral and consultation 8.0 days. With IAC, waiting times shortened with positive predictive correctness of initial diagnosis >75%. However only 21 % presented with symptoms of < 3months
[16]	2010-2011	Observational	612	Initiate 2 EARCs to identify EA	GP-referral delay for observed arthritis was 2.0 weeks to EARC, otherwise 9.4 weeks via regular referrals 51-59% of arthritis patients seen within 12 weeks, 32-38% within <12 months via regular referrals GP-delay decreased to 2 weeks in arthritis patients.
[13]	2009-2010	Observational	482	Quantify delay from first symptom until examination	Symptom onset to specialist exam 24 weeks, 84.2% of patients within 12 weeks after symptom onset Delay of 8 weeks, main delay GP referral to specialist
[20]	2009-2010	Observational	143	Apply the 2010 ACR/ EULAR criteria for RA to improve triage decisions and reduce waiting times	Wait times for referrals fulfilling and not fulfilling triage tool criteria were 7.9 weeks and 45.4 weeks, respectively 72 referrals did not meet criteria, 1/49 attending had RA. Characteristics for diagnosis of RA were sensitivity 96%, specificity 56%.
Retrospective Studies					
[19]	1997-2003		10 001	Document factors for delay of specialists' consultation	Waiting time (GP to specialist) 189.59 ± 253.12 days Factors for prompt consultation: younger patients, female sex, higher socioeconomic class, greater comorbidity
[14]	2005-2007		1953	Assess characteristics of patients' non-attendance	Waiting time for attending patients 51 days, for non-attending patients 75 days (p<0.0001) Waiting time as factor for non-attendance
[21]	2008		202	Assess waiting times for new-onset arthritis	Urgent cases were seen 34.6 days. post-referral; Inflammatory arthritis 6.4 days earlier than non-urgent cases 41.0 days. urgent cases (no formal triage)
[15]	2004-2006		169	Delay from symptom onset to assessment by rheuma-	Median delay: symptom onset to GP (12 weeks , Majority contributor of delay: Time until patients' IQR 4–28 weeks), referral from GP to specialist initial primary care contact being made (2 weeks, IQR <1-10) and additional 3 Rheumatic factor correlated with greater delay in weeks (IQR 2-8) until patient being seen by primary care (median delay of 13 weeks specialist after referral from GP compared to 4 weeks (p=0.011)
[22]	2010		100	Assess rheumatology re-ferral letters	Waiting time for all patients 54.7 days and 45.8 Lack of information results in inappropriate triage days with arthritis patients by specialists with prolonged waiting times

IA (immediate access), GP (general practitioner), IAC (immediate access clinic), EA (early arthritis), EARC (early arthritis recognition clinics), ACR (american college of rheumatology), EULAR (european league against rheumatism), RA (rheumatoid arthritis), IQR (interquartilw range)

are younger age, female sex, patients in higher socioeconomic class and patients with greater comorbidity [19].

Discussion

This study shows that a routinely used questionnaire for referral of unselected rheumatic patients is able to distinguish

between urgent and non-urgent initial appointments (with waiting times of 14.1 days and 24.6 days, respectively; p<0.001) (Figure 2 and 3). This reduction of waiting time for an urgent appointment by 10.5 days (= 42.7%) is even better than using a formal triage resulting in reduced waiting times of 6.4 days (= 15.6%) in patients with new-onset inflammatory arthropathies

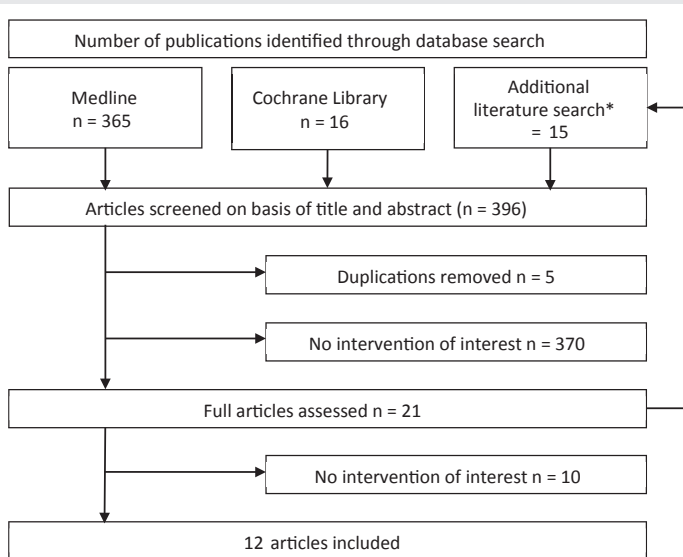


Figure 5: Selection of literature (*additional literature from full-text analyses)

[20–22]. It is important to note, that this approach using a questionnaire addressed not only arthritis but also other rheumatic diseases which have to be considered as “urgent” because of threatening disease complications like in giant cell arteritis or patients with other disease-specific clinical, laboratory and imaging findings. According to published data waiting times for patients with rheumatic diseases are still reported with up to 183 days [19], prompting the development of further strategies like the RUS to reduce waiting times at least for “urgent” patients.

Unfortunately, 27.5 % of appointments were incorrectly assigned, with 40.5% (n= 17) of urgent appointments used for non-urgent patients leading to or at least coinciding with 54.4% (n = 25) of urgent patients assigned to the normal waiting list. Without these incorrect assignments, the waiting times for urgent and non-urgent patients would have been 8.6 and 38.0 days, respectively ($p < 0.001$) (Figure 3b). As our short waiting list is still 2 weeks, further organizational improvements with correct calculation of the score and assignment of urgent and non-urgent appointments will further improve the waiting times for urgent patients. The reason for these false assignments is unclear to us. It can be speculated that the workload of the administrative personnel was too much, or they did not want to rely with their decision on an unevaluated questionnaire and scoring system. Because of the balanced number of available urgent and non-urgent time-slots, correct use of the RUS score in the future should not have any influence on the open slots for urgent appointments in the future.

The initial contact person of patients with an outpatient clinic is usually an employee of the administrative personnel. Although not always complete and correctly calculated, data collection, score calculations and management of appointments were routinely provided by administrative personnel, thus showing the practicability of such a score in daily practice. The rate of falsely assigned appointments should be further reduced, but using the new RUS, the administrative personnel is now able to perform a structured telephone interview, finally

deciding about the urgency of the appointment based on facts predefined by rheumatologists. The questionnaire can then be archived in the hospital documentation system to document the decision-process between urgent and non-urgent appointments. Such a tool has not been presented for unspecified rheumatic patients so far, and its further development and improvement with prospective evaluation of its usefulness will provide a practicable tool for the administrative personnel. A questionnaire is cost-efficient, and will allow a predefined process of assigning urgent appointments, which is also easy to document.

In practice, urgency points were assigned more frequently for referral, urgency information and clinical signs than for reported laboratory- and imaging findings. Information regarding laboratory- and imaging findings were available only in 33.3% and 17% of the patients, respectively. The high number of missing data may be a consequence of the free-life situation of the medical staff when making appointments, but also one could expect that laboratory tests are available more often especially if patients were referred by other physicians or clinical settings as was true in 96.1% of the patients. Therefore we anticipate that the use of electronic health records (EHRs) could provide more complete data not only for future examination by the specialists but already in the referral phase of assigning an urgent appointment. Indeed as a first consequence of this quality initiative, nurses were trained and encouraged to ask for items of the scoring sheet more precisely.

The most important limitation of this analyses is the lack of final diagnoses. Sub-analysis of the most important pathological findings like uveitis or inflammatory bowel disease did not show a difference in RUS whereas patients with specific imaging findings showed significant difference in RUS ($p = 0.012$) (Figure 4). Inter-rater reliability and other validations of the questionnaire have not been performed so far. A larger and prospective study will certainly allow more detailed conclusions on the validity of this score and even the value of single parameters for the predictability of the RUS score to correctly assign urgent appointments.

In conclusion, the RUS supports the facilitated and well-documented decision-making for urgent appointments. This pilot study led to several important aspects for further development of the RUS: First, administrative personnel has to be advised to calculate the score correctly and assign urgent appointments depending on RUS. Second, further prospective outcome studies to evaluate the validity of the RUS-questionnaire are warranted. Correcting the influence and weighting of domains and used items will be possible using a larger data set from a prospective trial. Thus RUS may improve the procedural quality in the referral process of unselected rheumatic patients from primary to secondary care, including those with immune-mediated rheumatic diseases.

Acknowledgements

We thank the administrative personnel of the rheumatology outpatient unit of Clinic II for their cooperation.

Funding

This work was funded by the Medical University of Innsbruck.

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