Development and Evaluation of a Clinic for Elderly Patients with Rheumatoid Arthritis and Multimorbidity: A Pilot Study

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Objective. Integrating patient’s and physician’s goals, especially in elderly patients with multimorbidity, might ultimately improve care. Efforts to develop such care innovations in patients with rheumatoid arthritis (RA) are lacking. The objective of our study was to develop and to pilot test a clinic for elderly patients with RA and multimorbidity.

Methods. First, a referral strategy for and the content of an Elderly Multimorbidity Clinic (EMC) was developed. Next, the EMC was implemented, and it primarily focused on the personal goals of patients and medication review. The EMC was evaluated in a quantitative–qualitative approach.

Results. Referral considered useful by the rheumatologist was chosen as the referral criterion. A rheumatologist and internist–geriatrician provided care to referred patients (≥55 years) at the EMC during three visits over 1 year. Twenty patients with RA participated in the pilot study (mean age 76.8±7.7 years; 30% male). Only 12 (60%) patients attended the first follow-up consultation, and three (15%) attended the second follow-up consultation. During any follow-up visit, 9/12 (75%) patients achieved one or more goals. Examples of accomplished goals were reduction of medication and improvement of mobility. In 19/20 (95%) patients, medication was remediated (stop medication for 13 patients; start medication for five patients) during the first visit. After 1 year, medication was changed back in 10 patients. Rheumatologists revealed uncertainty about meaningful referral, and patients and rheumatologists mentioned high (caregiver) burden because of extra visits as reasons for not attending follow-up. Patients were satisfied with the care provided.

Conclusion. This goal-directed EMC led to the accomplishment of at least one goal in 75% of patients. Sustained benefits could not be demonstrated because of low follow-up.

INTRODUCTION

Rheumatoid Arthritis (RA) is a chronic systemic inflammatory disease in which multimorbidity (ie, the presence of two or more long-term health conditions) might be viewed as the rule and not the exception. Multimorbidity is present in approximately two-thirds of people with RA and is associated with greater functional impairment, a negative impact on RA disease course, and a shorter life span (1,2). In addition to multimorbidity, elderly patients with RA suffer from geriatric syndromes (GS), such as sarcopenia and frailty (2). GS substantially contribute to morbidity and mortality in RA via multisystem dysregulations leading to functional decline and decreased physiologic reserve (2).

Elderly people with RA who also face multimorbidity and GS may need a different management approach because their needs are more than just those for the sum of individual diseases (3–5). For example, the pathophysiology, symptoms, and management of RA and other diseases might interact and alter the course of each disease, amplifying their effect on overall functioning and health (4). Antirheumatic management strategies are therefore often not directly applicable to patients with multimorbidity and RA (5). Also, single disease-oriented care may become burdensome for patients with multimorbidity because of inefficient care planning. Over the last few years, the results of several patient-centered interventions to optimize the management of patients with multimorbidity have been published (6–8). These interventions focused on research grants from Abbvie and Celgene to her department and has received consultancy fees from Union Chimique Belge, Lilly, Novartis, Sandoz, and Galapagos. No other disclosures relevant to this article were reported.

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**SIGNIFICANCE & INNOVATIONS**

- Elderly people with rheumatoid arthritis (RA) who also face multimorbidity may need a different management approach because single disease-oriented care can become burdensome because of inefficient care delivery.
- In this study, we evaluated whether comprehensive care, primarily focusing on patients' personal goals, resulted in more effective management of this specific patient group.
- Our goal-directed clinic for elderly patients with RA and multimorbidity led to the accomplishment of at least one goal in 75% of the 20 included patients. Sustained benefits could, however, not be demonstrated because of low follow-up.

Interdisciplinary team care interventions in general medical wards, for instance, proactively identifying patients with delirium and guiding them in its management by a care team (6,7). Other interventions included incorporation of patient-centered strategies in primary care for patients with multimorbidity, such as replacing disease-focused reviews of each health condition with one comprehensive multidisciplinary review by a nurse, pharmacist, and physician every 6 months (8,9). Overall, the effects of these interventions were disappointing. Both the quality of delivered health care (6,7) and patients' quality of life (8,9) did not improve. There are several reasons for the failure of these interventions. First, chronic diseases are by definition incurable, and many are progressive. Previously published high-quality interventions that could identify patients fitting the profile mentioned above. One published referral tool and two frailty instruments (the Groningen Frailty Indicator [GFI] and Tilburg Frailty Indicator [TFI]) that had the best face validity were selected (11–13). In addition, we analyzed whether the perspective of the patient could serve as referral instrument. The published referral tool included two main sections, including one on medical complexity (ie, number of comorbidities) and another on psychosocial factors (eg, inadequate social support) (11). The patient's ability to formulate personal goals was added to the tool, as this is a prerequisite for patient-centered care. Furthermore, the referral tool was slightly adapted to the Dutch health care system. Predictive validity of the referral instruments compared with the perspective of the rheumatologist on the usefulness of referral (external standard) was tested in a cross-sectional study including 90 patients with RA attending our regular clinic, stratified in three predefined age groups (55-64, 65-74, and ≥75 years) (14).

Of the 90 patients, 47 (52.2%) patients had two or more comorbidities, and 41 (45.6%) had polypharmacy; 29 (32.2%) patients had both two or more comorbidities and polypharmacy (Supplementary Table 1). Only 10 (11%) patients would be referred according to the referral tool, and approximately 45% of the patients were considered frail on either the GFI and/or TFI. Seventy (84.3%) patients indicated that they would be willing to attend an EMC if it existed. As for the external reference, 33 (37.5%) patients would be referred by their rheumatologist (Figure 1; see Supplementary Table 2 for the positive and negative predictive values of referral instruments). Based on the positive and negative predictive values, the referral tool performed best, but because its accuracy was considered too low, it was decided to continue with the opinion of the rheumatologist as the referral

**METHODS**

First, a referral strategy for and the content of the Elderly Multimorbidity Clinic (EMC) for patients with RA (≥ 55 years) were developed. Next, the EMC was implemented during a period of 1 year. The pilot study was evaluated by using a mixed quantitative–qualitative approach.

All phases of this quality-of-care intervention were approved by the Ethics Committee of the Maastricht University Medical Center.

**Development of a referral tool and intervention.**

*Referral tool.* First, we established the patient profile of who might benefit most from the EMC. Elderly patients with RA and rheumatologists were invited for semistructured interviews. Patients often prioritized the importance and treatment of their comorbidities over RA. For example, in approximately 50% of patients, adjustment of their RA medication was accepted because the health consequences of the comorbidity were felt to be more important. Rheumatologists indicated that in elderly patients with multimorbidity who were also frail and suffered from cognitive and physical decline, dependency, and polypharmacy, the treat-to-target model was not automatically adopted. Patients with this profile might benefit most from the EMC (5,10).

Next, we searched the literature for potential referral instruments that could identify patients fitting the profile mentioned above. One published referral tool and two frailty instruments (the Groningen Frailty Indicator [GFI] and Tilburg Frailty Indicator [TFI]) that had the best face validity were selected (11–13). In addition, we analyzed whether the perspective of the patient could serve as referral instrument. The published referral tool included two main sections, including one on medical complexity (ie, number of comorbidities) and another on psychosocial factors (eg, inadequate social support) (11). The patient's ability to formulate personal goals was added to the tool, as this is a prerequisite for patient-centered care. Furthermore, the referral tool was slightly adapted to the Dutch health care system. Predictive validity of the referral instruments compared with the perspective of the rheumatologist on the usefulness of referral (external standard) was tested in a cross-sectional study including 90 patients with RA attending our regular clinic, stratified in three predefined age groups (55-64, 65-74, and ≥75 years) (14).

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criterion. Apparently, the perceived usefulness of an ECM is not solely related to increasing age, polypharmacy, comorbidities, and frailty but a combination of these issues, likely with more intangible aspects, such as feeling inadequate as a caregiver in meeting patient needs.

**Intervention.** After referral, patients were seen by both a rheumatologist and internist–geriatrician. The visit was planned as follows: During the first appointment, patients were invited to formulate personal goals, and a medication review was planned. Patients were asked to formulate a maximum of three goals. After this, the medical specialists discussed the personal goals with the patient, identified the most important health problems of the patient, and asked disease-specific questions according to the patient’s conditions. At the end of the visit, an action plan based on the personal goals and medication review was formulated and discussed with the patient. Both the general practitioner and referring rheumatologist received a copy of this action plan. During both follow-up appointments, the personal goals were discussed, and the medication review was repeated.

**Pilot study EMC.** A single-center prospective pilot study in patients ≥55 years with RA and multimorbidity was conducted at the Maastricht University Medical Center+, the Netherlands, between April 2018 and March 2019. Exclusion criteria for a visit to the clinic were the following: no benefit of the intervention according to the rheumatologist’s opinion, patient was not able to formulate personal goals, patient had severe cognitive decline, and/or no informed consent was given. After signing informed consent forms, patients were invited to visit the EMC.

**Assessment, health outcomes, and process evaluation.** Before the first appointment at the EMC, baseline characteristics were collected (age, sex, marital status, smoking status, alcohol use, presence of polypharmacy, RA disease duration, comorbidities, and number of hospitalizations and outpatient visits over the last 6 months). The following eight questionnaires were administered both at baseline and at 6 months: the 11-item De Jong Gierveld Loneliness Scale, the Barthel index (BI), the Lawton-Brody Instrumental Activities of Daily Living Scale (IADL), the Geriatric Depression Scale 15 (GDS-15), the Short Form 36 (SF-36), the Euro-Qol5D (EQ-5D), the GFI, and a questionnaire evaluating the delivered health care. After the first follow-up appointment (3 months), only the questionnaire evaluating delivered health care was repeated. The medication list was checked 1 year after the first appointment to the clinic by chart review.

A successful visit to the outpatient clinic was defined when one or more personal goals were reached. Second, improving health care use by reducing the total number of outpatient visits and the result of the medication review were also evaluated.

After the pilot study, semistructured interviews took place with patients, rheumatologists, and the internist–geriatrician. Barriers, facilitators, and satisfaction with the referral strategy were assessed. Additionally, we evaluated whether interviewed patients had reached their personal goals and how patients and medical specialists experienced the care that was delivered at the EMC. An interview guide was developed that addressed all important topics (a summary can be found in Supplementary Table 3).
RESULTS

A total of 20 patients with RA were referred to the new clinic over a period of 6 months. Baseline characteristics can be found in Table 1. The mean age was 76.8 ± 7.7 years and 6 (30%) of 20 patients were male. All patients had polypharmacy, and the median number of comorbidities was 3.0 (interquartile range [IQR] 3.0-3.0). Thirteen (65%) of 20 patients received glucocorticoids on a daily basis (mean 4.75 mg; IQR 0-5). Seventeen (85%) patients were frail on the GFI, and the mean EuroQol Visual Analogue Scale (EQVAS) score (range 0-100, with 0 indicating the worst health imaginable) was 40 (IQR 35-70).

Only 12 patients (60%) attended the first follow-up consultation, and only three (15%) attended the second. There were several reasons for discontinuation of the consultations. First, although an important goal of the clinic was to coordinate the patients’ health care network, several patients indicated that an extra visit to the clinic resulted in a (caregiver) burden that was too high. Second, some patients achieved their personal goals, and they indicated that they saw no benefit of an additional follow-up visit. Third, one patient was wrongly referred by the rheumatologist.

Evaluation of personal goals. Personal goals included reduction of physical complaints not caused by RA (eg, vertigo or dyspnea) (8/20), less pain because of RA (15/20), medication remediation (9/20), and social goals (eg, being able to go out with friends again) (6/20). Tracking goals was possible in the 12 (60%) patients who had at least one follow-up consultation. Of these, nine (75%) patients achieved one or more goals. Eight of 12 patients (66.7%) also had medication remediation as a personal goal. In six of eight (75%) patients, this goal was initially accomplished, but over time medication was changed back. Goals accomplished were, for instance, less pain and reduction in physical complaints by making changes in prescribed medication or referring to a physiotherapist.

Evaluation of medication review. In 19 (95%) of 20 patients, medication was remediated during the first consultation. Eight (42%) of 19 patients also had medication remediation as a personal goal (see above). In 13 patients, at least one medication was changed back. In nine cases, this was due to worsening of the complaints (eg, dyspnea or pain). One patient experienced side effects from the substituted medication.

Table 1. Baseline characteristics.

| Variable                        | Total Group (n = 20) |
|---------------------------------|---------------------|
| Demographic characteristics     |                     |
| Male                            | 6 (30)              |
| Age, mean (IQR), yr             | 77.5 (72.5-81.8)    |
| BMI, mean (IQR)                 | 24.4 (20.7-27.0)    |
| Married or living together, n (%)| 12 (63.2)           |
| Community dwelling, n (%)       | 20 (100)            |
| Received informal care, n (%)   | 8 (40)              |
| Smoking status, n (%)           |                     |
| Smoker                          | 5 (25)              |
| Alcohol use, n (%)              | 14 (70)             |
| Clinical characteristics        |                     |
| Disease duration (years), median (IQR) | 18.0 (5.3-35.8) |
| Use glucocorticoids (prednisone) | 13 (65)           |
| Mean dosage (mg) (IQR)          | 4.75 (0-5)          |
| Use csDMARD                      | 11 (55)             |
| Use bDMARD                       | 6 (30)              |
| Polypharmacy reported by rheumatologist (≥5 medications) | 20 (100) |
| Comorbidities, median (IQR)     | 3.0 (3.0-3.0)       |
| Classified as frail on GFI      | 17 (85)             |
| GFI total score, median (IQR)   | 6.0 (4.0-9.8)       |
| Resource use                    |                     |
| Nonrheumatologic appointments with specialist within the past 6 months, median (IQR) | 3.0 (1.0-9.3) |
| Frequent hospitalizations (≥2 in a year) | 8 (40) |
| Questionnaires                  |                     |
| EQ-5D, total score              | 0.6 (0.1-0.7)       |
| EQVAS score (scale 0-100)       | 40 (35-70)          |
| SF-36 (0-100)                   |                     |
| Physical component              | 26.0 (21.7-33.3)    |
| Mental component                | 43.6 (38.7-55.2)    |
| Loneliness (0-11)               | 5.5 (5.0-6.0)       |
| GFI (0-15)                      | 6.0 (4.0-9.8)       |
| GDS-15 (0-15)                   | 6.0 (5.0-7.0)       |
| BI (0-20)                       | 16.5 (13.5-18.8)    |
| IADL (0-21)                     | 7.0 (3.3-8.8)       |

All values are presented as median (interquartile range). Data are missing in one patient.

BI, Barthel Index; BMI, body mass index; bDMARD, biologic disease-modifying antirheumatic drug; csDMARD, conventional synthetic disease-modifying antirheumatic drug; EQ-5D, EuroQol-5D; EQVAS, EuroQol Visual Analogue Scale; GDS-15, Geriatric Depression Scale 15 items; GFI, Groningen Frailty Indicator; IQR, interquartile range; IADL, Lawton-Brody Instrumental Activities of Daily Living Scale; SF-36, Short Form 36.

was stopped; in five patients, medication was started; in four patients, medication was substituted, and in 14 patients, the dose was changed. The median number of medications stopped was 1.0 (IQR 1.0-2.0).

Cardiovascular medication was changed most often (63.2%) followed by antirheumatic medication (36.8%) and analgesics (26.3%). Chart review 1 year after the baseline visit revealed that the changes in medication were sustained in 9 of 19 patients. In the other 10 (52.6%) patients, at least one medication was changed back. In nine cases, this was due to worsening of the complaints (eg, dyspnea or pain). One patient experienced side effects from the substituted medication.
Coordinating health care network. To achieve the personal goals as mentioned above, more care was sometimes initiated. One patient was referred to the cardiologist, four patients were referred to the physiotherapist, two were referred to the occupational therapist, and one was referred to the pedorthist.

Quality of care. Before the first visit to the clinic, 17 (85%) of 20 patients already felt involved in the decision-making process, and 19 (95%) patients had the feeling that they were treated as an individual by their rheumatologist. Five (25%) patients responded neutrally or negatively when asked whether all involved health care professionals had a good overview of their current health situation. Only 70% of patients completely understood their personal management plan. After the first follow-up visit (data available for 10 patients), the opinion about delivered health care was not changed.

Other health outcomes (questionnaires; eg, EQ-5D and SF-36). Because only three patients filled out all questionnaires twice, reliable conclusions could not be drawn.

Medical specialist interviews. The majority of 11 interviewed rheumatologists (in training) expressed that it was sometimes challenging to refer a patient. Some preferred to solve the medical problem themselves. Two rheumatologists specified that despite explaining the goal of the EMC, patients did not want to participate because this would involve an extra hospital visit.

When asked what the added value was of the clinic, opinions were divided among the interviewed rheumatologists. They all acknowledged the value of medication review and listening to the patient’s needs. All nine referring rheumatologists saw the greater good in a more holistic approach (quote 1). The majority of the rheumatologists, however, indicated that this clinic should be seen as extra care, not substitution of care.

According to the two coordinating medical specialists who coordinated the EMC, the visit had additional value in approximately two-thirds of the patients, mainly because of the medication review. The coordinating rheumatologist described several patient goals that were more functional and focused on specific daily activities (for example, being able to work on a stamp collection again). Physician goals were focused on less RA disease activity; these goals were not translated to functional goals (quote 2). For several patients, the clinic had no additional value. Some of these patients found it difficult to formulate personal goals or were unable to make the extra effort to achieve the goal.

• Quote 1: “I really think that it is good to involve a generalist and to look at how all the problems are related to each other.”
• Quote 2: “What really surprised me were the goals of the patients. Their goals were more holistic, more functional. My goal was more like, I need to control the disease.”

Patient interviews. In total, 10 patients were interviewed (five men and five women; mean age 79.5 ± 5.3 years; all had three or more comorbidities). Half of the patients indicated that they had no expectations about the actual visit to the EMC despite an information letter. All patients expressed positive feelings about their visit. For example, patients had the feeling that they were being heard (quote 3). Medication was changed in all 10 interviewed patients, and the majority expressed that this was a positive outcome. The comprehensive approach was reported as positive (quote 4). Seven of 10 patients elaborated further on this topic and were pleased with the fact that two medical specialists looked at their main medical problems at the same time in one consultation. When asked whether the patient would visit the clinic again if this would become the standard of care, all responded positively and mentioned that bundling consultations would be beneficial to them. However, some patients preferred the involvement of another medical specialist, as these patients had important cardiovascular or pulmonary comorbidities.

• Quote 3: “I felt being heard and they listen to you. They do not look at the clock.”
• Quote 4: “The advantage? That they take everything that I have in account. And when I go to only one specialist, he only looks at the problem that is his specialization. And then it stops.”

DISCUSSION

To our knowledge, this is the first study that developed and subsequently pilot-tested an outpatient clinic with a focus on personal goals for elderly patients with RA and multimorbidity. The project revealed several needs of this specific patient group. Patients were positive about the comprehensive care that was delivered, personal goals were accomplished in 75% of the patients with at least one follow-up visit, and medication was remediated in the majority of cases.

However, there were several challenges when delivering health care to this specific patient group. First, it proved to be difficult to develop a good referral strategy because all referral instruments were unable to adequately select elderly patients with RA and multimorbidity. The perspective of the rheumatologist was therefore directive in the end. Although the referral process was made as simple as possible, several rheumatologists found it difficult to select patients who might actually benefit from a visit. Targeting patients for multimorbid care management interventions is challenging. Unlike disease management programs, multimorbid patient selection is complicated because of the lack of clear criteria (15). The referral instruments that were evaluated in our study did not perform well. Intangible aspects, such as a “gut feeling” that this patient might need extra care or the inability to meet the medical needs of the patient as a rheumatologist, were often considered important reasons for referral. Inefficiency in the
selection of patients who should actually visited the clinic might have contributed to the high loss to follow-up in the end.

Second, patients appreciated the comprehensive care and attention provided at the clinic and personal goals were accomplished, but the effects on health and wellbeing could not be demonstrated. The personal goals that were formulated were often not related to RA but to common geriatric complaints (eg, less vertigo) or social issues (eg, going out with friends again). The main effect of the clinic was a reduction or change in the number of prescribed medications, and this effect was sustained in approximately half of the cases. It is well known that polypharmacy is common in the elderly population and is often related to multimorbidity (16,17). Results of an international survey among 410 rheumatologists by Roodenrijs et al about characteristics of difficult-to-treat RA showed that both interfering comorbidities and polypharmacy were an important concern currently missing in RA management recommendations (17). Our study shows that critically reviewing medication is an important goal for many patients, and in the short term, this goal was often achieved. However, in the long term, medication was often changed back because of regaining complaints or new complaints. This is in line with previous studies that found that a single medication review has an effect on most drug-related outcomes, such as the number of drugs and number of drug-related problems. However, there is only a minimal effect on clinical outcomes and no effect on quality of life (18).

We hoped that by developing a clinic especially for patients with RA and multimorbidity, we could address the needs for this specific patient group. During the interviews, patients indeed indicated that they were positive about the personal and comprehensive care provided at the clinic. Unfortunately, we could not demonstrate an improvement in the delivery of health care (high loss to follow-up) or improvement of the health status of the patient.

In conclusion, our clinic especially for elderly patients with RA and multimorbidity showed that patients highly appreciated the comprehensive care. We were, however, unable to show benefits in the long term because of the limitations described above. The way forward is to first develop tools that can adequately select patients who might actually benefit from this type of intervention. Furthermore, it is important to ensure that coordinating the health care network of patients does not lead to an unwanted increase in resource use and caregiver burden.

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AUTHOR CONTRIBUTIONS

All authors were involved in drafting the article or revising it critically for important intellectual content, and all authors approved the final version to be published. Dr. van Onna had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

Study conception and design. Magdelijns, Cleutjens, Boonen, van Onna.

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