Research article

Prevalence of functional disability in patients with rheumatoid arthritis attending the rheumatoid outpatient clinic at Kenyatta National Hospital

Odundo BO, Ogola EN, Oyoo GO, Genga EK

Department of Clinical Medicine and Therapeutics, School of Medicine, College of Health Sciences, University of Nairobi, P.O. Box 19676-00202, Nairobi, Kenya

Corresponding author:
Dr Bernard O Odundo.
Email: odundob@gmail.com

Abstract

Background: Rheumatoid Arthritis (RA) causes serious joint erosion, deformity and severe functional disability if not diagnosed early and followed by a timely initiation of Disease Modifying Anti-Rheumatic Drugs (DMARDs). Studies have shown that functional disability is a major determinant on the patients' quality of life and it is a strong predictor of morbidity, work disability and mortality. Functional disability is measured by patient-oriented tools such as the Health Questionnaire Disability Index (HAQ-DI) which is the gold standard tool.
Objective: This study aimed to determine the prevalence of RA functional disability and its association with disease activity, socio-demographic and clinical characteristics in patients with rheumatoid arthritis on follow up at the Rheumatology Outpatient Clinic in Kenyatta National Hospital (KNH).
Design: This was a descriptive cross-sectional hospital-based study.
Setting: Rheumatology Outpatient Clinic (ROPC) at the Kenyatta National Hospital (KNH); the largest public national and referral hospital in Kenya.
Subjects: One hundred and six patients who fulfilled the 2010 American College of Rheumatology and the European League Against Rheumatism (ACR-EULAR) criteria.
Results: There were 102(96.2%) females and 4(3.8%) males recruited into the study with a female to male ratio of 10:1. The prevalence of functional disability was 72.6% with a mean HAQ-DI of 0.41±0.38 which is interpreted as mild disability. Active disease was present in 90.6% of the patients with a median CDAI of 11(IQ range 6.5-22) and mean CDAI score of 15.95±13.08 which represents moderate disease activity and only 9.4% were in remission. The average duration of disease was 5.1 years. Functional disability was significantly correlated with disease duration and treatment duration.
Conclusion: The study demonstrated a high prevalence of functional disability and a higher disease activity of among RA patients in our setting despite being on DMARDs. There was a significant correlation between functional disability and disease duration. However, there were no correlations between functional disability and any of the socio-demographic study variables; age, sex, marital status, employment, education and smoking history.

Introduction

Rheumatoid Arthritis (RA) is a chronic systemic autoimmune and the most common inflammatory arthritis that often leads to varying degrees of functional disability. It has been estimated that more than half of all patients with RA will deteriorate to severe functional disability after 10 years of the disease[1]. Functional disability is a strong independent predictor other long term outcomes such as work disability, morbidity and mortality[2,3].

We used the Health Assessment Questionnaire-Disability Index (HAQ-DI) to assess. HAQ-DI the patient's ability to perform Activities of Daily Living (ADL) such as dressing, eating, toileting, shopping, and travelling. The disease activity was assessed using the Clinical Disease Activity Index (CDAI) which excludes laboratory parameters.

Materials and methods

This was a hospital-based cross-sectional descriptive study conducted between 2nd August and 11th October 2018 targeting RA patients attending KNH Rheumatology Outpatient Clinic. The study was approved by the institutional ethics and research review board. Patients with a file diagnosis of RA at the ROPC were screened consecutively until a sample of 106 was reached. All patients recruited fulfilled the inclusion criteria: aged 18 years and above who met the 2010 American College of Rheumatology-European League Against Rheumatism (ACR-EULAR) criteria for RA[4] and gave written informed consent.

Targeted clinical history for socio-demographic such as age, sex, employment and marital status and for clinical variables such as disease duration and treatment modality using a data abstraction tool. Patients were then issued the HAQ-DI questionnaire for evaluation of functional status followed by joint assessment out of a 28-joint count. The patient global assessment of general health and the provider assessment of general health, both on a scale of 0-10 cm, was carried out. The composite of tender and swollen joint counts and the global assessment of general health was used to compute the CDAI score for each patient. Disease activity was categorized as remission, mild, moderate or severe disease while functional disability was categorized as no disability, mild disability, moderate to moderately severe and severe disability.

Data analysis and statistical method: Data was cleaned, verified and coded, entered into Microsoft excel database and subsequently exported to Statistical Package for Social Sciences (SPSS) 21.1. for statistical analysis. Data was summarized into proportions for categorical variables and into means (SD) or medians for the continuous variables. Continuous variables such as age and duration of disease were expressed as means and Standard Deviations (SD) and plotted in histograms. Prevalence was determined and expressed as a percentage with 95% confidence interval. For categorical variables such as sex and marital status, pie charts were plot; frequencies and proportions were reported. Correlations between functional disability to continuous variables or a categorical variable was analyzed by Pearson correlation coefficient and student t-test respectively. A significant association was a p-value of <0.05.

Results

There was a female preponderance of 102(96.2%) with a female to male ratio of 10:1. The patients were aged between 18 and 83 years and were normally distributed with a mean age of 48.4 ±14.9 years. Fifty nine (55.6%) of the patients were employed and majority had some formal education; secondary 45(42.5%) or primary 31 (29.2%) and tertiary 21(19.8%).

Over three-quarters (88.4%) were married and majority never smoked (99.1%). Table 1 shows their socio-demographic characteristics.

Majority of the patients, 96(90.6%) had disease duration of more than a year and 67(63.2%) had treatment duration between 1-5 years. Most patients were on combination DMARD therapy, and the combination of methotrexate and hydroxychloroquine (34.9%) being the most common. None of the patients reported recent or current steroid use and none of them was on a biologic DMARD agent. However, 58(54.8%) of them reported frequent use of over-the-counter NSAIDs or intermittent short-term prescription NSAIDs. Table 2 summarizes the baseline clinical characteristics.

Table 1: Baseline socio-demographic characteristics of the participants

	Socio-demographic variables	Frequency (n)	(%)
Age (years)	18-27	8	7.5
	28-37	22	20.8
	38-47	23	21.7
	48-57	22	20.8
	58-67	20	18.9
	68-77	7	6.6
	78-87	4	3.8
Sex	Male	4	3.8
	Female	102	96.2
Marital status	Married	94	88.7
	Single	7	7.0
	Widowed	2	1.9
	Separated	3	2.8
Employment status	Unemployed	47	44.3
	Employed	19	17.9
	Self employed	40	37.7
Education level	None	9	8.5
	Primary	31	29.2
	Secondary	45	42.5
	Tertiary	21	19.8
Smoking history	No	105	99.1
	Yes	1	0.9

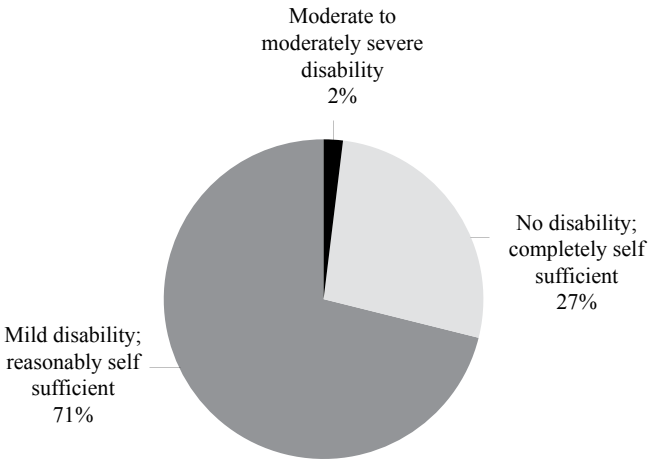
Table 2: Baseline clinical history of study participants

Clinical history		Frequency (n)	(%)
Treatment duration			
	<1	8	7.5
	1-5	67	63.2
	>5	31	29.2
Treatment modality			
DMARDs			
	HCQ	16	15.1
	LEF	11	10.4
	LEF/HCQ	19	17.9
	LEF/SSZ	3	2.8
	MTX	10	9.4
	MTX/HCQ	37	34.9
	MTX/LEF	10	9.4
	NSAIDs	58	54.8
	GC	0	0
	Biologic	0	0
Disease duration			
	<1	8	7.5
	1	2	1.9
	>1	96	90.6

*HCQ -Hydroxychloroquine; LEF-Leflunomide; SSZ -Sulfasalazine; MTX -Methotrexate; NSAIDs -Non-steroidal anti-inflammatory drugs; GC-Glucocorticoid

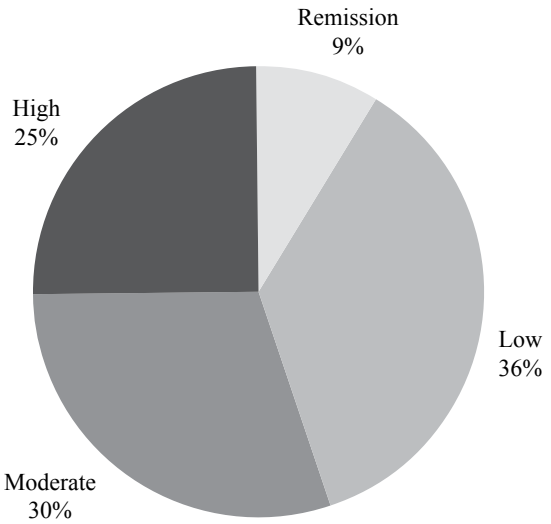
Prevalence of functional disability: Of the 106 patients evaluated, 77(72.6%) were found to have functional disability out of which the majority 75(70.8%) had a mild disability and only 2(1.9%) had moderate to moderately severe disability with HAQ-DI scores of >1.25≤2.00. The mean HAQ-DI score was 0.41(±0.38) and a median HAQ-DI of 0.5(0.00-0.625) which translated to majority having mild functional disability (Figure 1).

Figure 1: Prevalence of functional disability



Prevalence of active disease: Ninety six (90.6%) of the patients had an active disease and only 10(9.4%) were in remission (Figure 2). Of those with active disease, 38(35.8%) had low disease activity, 32 (30.2%) had moderate disease activity and 26(24.5%) had high disease activity. The mean CDAI score was 15.94(±13.08) interpreted as moderate disease activity, median of CDAI was 11(6.5-22).

Figure 2: Disease activity



Association of HAQ-DI to socio-demographic characteristics: None of the socio-demographic variables was found to be significantly correlated with HAQ-DI (P >0.05).

Association of HAQ-DI to disease specific variables: HAQ-DI was found to be significantly correlated with treatment duration (p=0.037) and disease duration (p=0.047). The use of DMARDs was also found to be correlated to HAQ-DI. However, disease activity (CDAI) was found not statistically correlated to HAQ-DI (p= 0.63).

Discussion

The study found an overall prevalence of functional disability in this population of RA patients to be 72.6% with a mean ±SD HAQ-DI score of 0.41±0.38), median HAQ-DI of 0.5(IQR: 0-0.63). Only 17.4% had no disability. Though the prevalence was high in our study, majority of the patients (71%) had mild disability and were reasonably self-sufficient. Only 2% had moderate to moderately severe disability. This prevalence is comparable but lower to that found in similar studies in Africa. In South Africa, in a study of functional disability in 108 RA patients at a public healthcare clinic, Westaway *et al*[5] found an overall prevalence of 83%; the median HAQ-DI score was 1.6 translated as moderate to moderately severe disability, though majority (61%) of the patients in their study had worse HAQ-DI scores of >1.2. Basma *et al*[6] in Libya, in a study of HRQOL of 100 RA patients, found a median HAQ-DI score of 0.75 and 63% of patients had HAQ-DI of between 0-1. However, in this study by Basma *et al*[6] they had a selection bias; they recruited only pre-selected patients with DAS28 scores of 2.6-5.1 and excluded patients in remission and those with high disease activity. In China, Zhao *et al*[7] in a cross-sectional study, the incidence and influencing factors of functional disability in Chinese patients with RA, found a lower prevalence of 58.5% with mean ±SD HAQ-DI scores of 0.665±0.675 and patients with better pain management with a good social support showing better physical function scores.

Most of the patients in our study had an active disease and only 10(9.4%) were in remission despite all of them being on therapy with DMARDs. Therefore, this could warrant the need for tighter control of disease activity. It is rather not surprising that over half (54.8%) of our patients were on intermittent NSAIDs and majority were on combination DMARDs. A high number of patients on combination DMARDs had longer treatment duration between one to five years.

Although, steroids are indicated in early aggressive disease and to alleviate symptoms in acute flares, none of our study subjects was on steroids may be due to adherence to current treatment guidelines that recommends steroid sparing and emphasizes the early use of synthetic DMARDs to achieve remission in a treat-to-target strategy[8]. Ndirangu *et al*[9] in a Master of Medicine thesis in a study of disease activity measures in RA in this same population found 62.5% of the patients were on steroids. A similar trend by Basma *et al*[6] also showed 65% of the patients in the study were on steroids.

None of the patients in our study was on biologic agents which have been shown to improve outcome in patients with suboptimal response and/or intolerance to traditional DMARDs, probably due to the prohibitive cost of biologics and considering that our setting is a public health facility where most of our patients may not afford to sustain biologic therapy. Oyoo *et al*[10], in a study of rituximab, a monoclonal antibody to B-cells, in RA patients with suboptimal response to traditional DMARDs in RA who had to be switched to rituximab found a significant improvement in disease activity, functional and disability indices after six months of therapy.

Although this study found a statistically significant correlation of functional disability (HAQ-DI) to disease duration (p=0.047) and treatment duration (p=0.037) it was not powered enough to assess the association of treatment modality to functional disability. However, this finding may point to a progressive disease with structural joint damage that can only be assessed radiographically which was a limitation in this study due to resource constraint[11]. This association was in keeping with similar studies that assessed the correlation of disease duration to functional disability. In a longitudinal study of response to therapy of 134 DMARD-naïve patients in South Africa, Hodkinson *et al*[12] found significant improvement in functional disability and HRQOL as assessed by HAQ-DI and SF-36 after 12 months of traditional DMARD therapy but substantial functional disability (HAQ>5) persisted in 69% of the patients.

There was no significant correlation of functional disability to any of the socio-demographic variables. This finding was similar to the study by Oyoo *et al*[10] in similar population in Kenya where no association was found between functional disability using SDAI and different variables such as age, type of DMARD and steroid used though the study was not powered enough to make significant conclusions out of these findings. However, Solomon *et al*[13], in a comparative study of functional disability in patients with RA in public health care and private health care in South Africa, found worse physical function in the former signifying poor disease management due to socioeconomic factors. This was a single center study in a public health care facility hence probably there were no overall significant socio-economic differences that would impact on functional capacity. In a systematic review of the impact of educational level on RA, Lopez-Castillo *et al*[14] found that educational level influenced the risk and clinical course of RA and low educational level worsened functional disability and work disability. This study found most patients (63.3%) had a high formal education and majority had good social support; 96.2% were married and 55.6% were in active employment. Though smoking has been shown to aggravate RA outcomes, only one patient was a smoker and this could not alter the overall associations of disease activity to functional disability.

Conclusion

The study demonstrated a high prevalence of functional disability and a higher disease activity of among RA patients in our setting despite being on DMARDs. There was a significant correlation between functional disability and disease duration. However, there were no correlations between functional disability and any of the socio-demographic study variables; age, sex, marital status, employment, education and smoking history. Therefore, there is need for early initiation and optimization of DMARDs together with strict monitoring of functional disability and disease activity according to guidelines to improve patient and disease outcomes in RA.

Acknowledgements

To my family, supervisors, lecturers and colleagues in the Department of Clinical Medicine and Therapeutics, University of Nairobi for their advice and support.

References

1. Wolfe F. 50 years of antirheumatic therapy: the prognosis of rheumatoid arthritis. *J Rheumatol (Suppl)*. 1990; **22**:24–32.
2. Verstappen SMM, Bijlsma JWJ, Verkleij H, Buskens E, Blaauw AAM, ter Borg EJ, *et al.* Overview of work disability in rheumatoid arthritis patients as observed in cross-sectional and longitudinal surveys. *Arthritis Care Res (Hoboken)*. 2004; **51**(3):488–497.
3. Wolfe F, Michaud K, Gefeller O, Choi HK. Predicting mortality in patients with rheumatoid arthritis. *Arthritis Rheum.* 2003; **48**(6):1530–42.
4. Aletaha D, Neogi T, Silman AJ, Funovits J, Felson DT, Bingham CO, *et al*. Rheumatoid arthritis classification criteria: An American College of Rheumatology/ European League Against Rheumatism collaborative initiative. *Arthritis Rheum.* 2010; **62**(9):2569–81.
5. Westaway MS, Rheeder P, Guloba G. Rheumatoid arthritis functional disability in a public health care clinic. *South Afr Med J.* 2008; **98**: 706.
6. Basma E, Tarsin RJM. Health related Quality of Life in Libyan patients with rheumatoid arthritis. *Afr J Rheumatol.* 2013; **1**(2):57–60.
7. Zhao S, Chen Y, Chen H. Sociodemographic factors associated with functional disability in outpatients with rheumatoid arthritis in Southwest China. *Clin Rheumatol.* 2015; **34**(5):845–851.
8. Smolen JS, Landewé R, Bijlsma J, Burmester G, Chatzidionysiou K, Dougados M, *et al.* EULAR recommendations for the management of rheumatoid arthritis with synthetic and biological disease-modifying antirheumatic drugs: 2016 update. *Ann Rheum Dis.* 2012; **64**(5):640-647.

9. Ndirangu K, Oyoo G, Bhatt K, Ilovi C. Disease activity measurement in rheumatoid arthritis: comparison of 3 disease activity index tools at Kenyatta National Hospital. *Afr J Rheumatol.* 2016; **4**(1):19–24.
10. Oyoo G, Otieno F, Mbuthia B, Omondi E, Genga E. Experience with rituximab in patients with rheumatoid arthritis in Nairobi, Kenya. *Afr J Rheumatol.* 2015; **3**(1):17–21.
11. Pincus T, Callahan LF. What is the natural history of rheumatoid arthritis? *Rheum Dis Clin North Am.* 1993; **19**(1):123–151.
12. Hodkinson B, Musenge E, Ally M, Meyer P, Anderson R, Tikly M. Functional disability and health-related quality of life in South Africans with early rheumatoid arthritis. *Scand J Rheumatol.* 2012; **41**(5):366–374.
13. Solomon A, Christian BF, Dessein PH, Stanwix AE, Lock P, Vallance R, *et al.* The need for tighter rheumatoid arthritis control in a South African public health care center. *Semin Arthritis Rheum.* 2005; **35**(2):122–131.
14. López-Castillo CA, Calderón-Rojas R, Amaya-Amaya J, DeSanVicente-Célis Z, Mantilla RD, Rojas-Villarraga A. Impact of educational level on rheumatoid arthritis: A systematic review. *Rev Colomb Rheumatol.* 2014; **21**(4):201–212.