8.5±3.3 years (2 months–22 years). The HS mean (Kg) was 20.9±7.1 [95%CI 20.07–21.7]. The Quick-DASH mean was 28.08±11.90 [95%CI 26.7–29.45]. The AIMS-2 hand and finger mean score was 4.5±2.21 [95%CI 4.24–4.75]. The Hand HAQ mean score was 9.8±4.3 [95%CI 9.3–10.31] and the ROAD-upper extremity mean score was 4.75±2.11 [95%CI 4.5–5]. A positive statistically significant correlation was noted between the five indices ($p<0.0001$). The area under the ROC (AUC-ROC) were similar in all the measures although the HS showed the greatest discriminative ability (Table 1 and Figure 1).

Table 1. ROC curve analysis for the discriminatory power of functional disability, according to the different measures

Variable	AUC	SE ^a	95% CI ^b
AIMS-2 hand/finger function	0,839	0,0317	0,792 to 0,879
Hand HAQ	0,846	0,0306	0,799 to 0,885
QuickDASH	0,863	0,0239	0,818 to 0,900
ROAD upper extremity function	0,816	0,0279	0,766 to 0,858
Handgrip strength (Kg)	0,900	0,0206	0,860 to 0,932

Figure 1. ROC of measures of upper extremity disease activity measures used in rheumatoid arthritis. ROC illustrating the relationship between sensitivity and complement of specificity (100-specificity) in RA for functional measures using PASS as an external indicator.

Conclusion: HS is a good alternative to the self-assessment functional indices for the evaluation of functional disability in RA. The use of an electronic grip device for HS measurement makes it easier to collect data and should be applied in both clinical trials and routine clinical care settings.

REFERENCES

- [1] Salaffi F, Di Carlo M, Carotti M, Farah S. "Validity and interpretability of the QuickDASH in the assessment of hand disability in rheumatoid arthritis". *Rheumatol Int*. 2018 Dec 3.
- [2] Salaffi F, Carotti M, Gutierrez M, Di Carlo M, De Angelis R. "Patient Acceptable Symptom State in Self-Report Questionnaires and Composite Clinical Disease Index for Assessing Rheumatoid Arthritis Activity: Identification of Cut-Off Points for Routine Care". *Biomed Res Int*. 2015
- [3] Salaffi F, Stancati A, Neri R, Grassi W, Bombardieri S. "Measuring functional disability in early rheumatoid arthritis: the validity, reliability and responsiveness of the Recent-Onset Arthritis Disability (ROAD) index". *Clin Exp Rheumatol*. 2005 Sep-Oct;23(5 Suppl 39):S31-42.

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AB0279

RENAL INVOLVEMENT AND CAUSES OF DEATH IN RHEUMATOID ARTHRITIS PATIENTS ACCORDING TO THE AUTOPSY DATA

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Background: Renal involvement is a clinically significant manifestation in rheumatoid arthritis (RA) patients with potential influence on the treatment, prognosis and outcome of this disease while rare publications are available on kidney damage in RA [1,2].

Objectives: To estimate the frequency and characteristics of renal involvement and causes of death in RA patients on the basis of autopsy data reports and postmortem microscopic examinations.

Methods: We have analyzed 21 814 autopsy data reports performed during 10-year period (2001-2010) and 6720 cases of autopsy performed 5 years later (2016-2018) in the Minsk City Clinical Pathologoanatomic Bureau (The Republic of Belarus).

Results: For the period 2001-2010 autopsies were performed in 110 RA patients: 91 women and 19 men of 67.0 (13.1) years old, M (SD). Renal involvement was revealed in 75 patients (68.2%). The most common type of renal involvement was secondary AA amyloidosis - 44 patients (40%). Other types of revealed renal lesions (n=31, 28.2%) were mesangial proliferative glomerulonephritis (n=3; 2.7%), nephroangiosclerosis (n=14, 12.8%), tubulointerstitial nephritis (n=2, 1.8%), chronic pyelonephritis (n=10, 9.1%) and renal vessel vasculitis (n=2, 1.8%).

The main cause of death in RA patients with amyloidosis was end-stage renal disease (ESRD, 43.2%), whereas in other patients the common causes of death were cardiovascular events (43.2%) and secondary infections (33.3%). In case of secondary amyloidosis the deposits of amyloid were found in kidney of all RA patients (100%), in adrenal glands - in 36.4% and in spleen - in 34.1% of RA patients. Amyloid deposits in other internal organs were not nearly as common.

In 2016-2018 50 patients with RA have been autopsied with mean age of death 72.0 (15.2) years old. Renal involvement was revealed in 34 (68.0%) of autopsies: as secondary amyloidosis in 29 patients (58.0%) and as focal segmental glomerulosclerosis or mesangial proliferative glomerulonephritis in 5 patients (10.0%). The most common cause of death in this group of RA patients were cardiovascular events (58.0%), fatal infectious complications developed in 16.0% of patients, ESRD was revealed only in 4.0% of patients.

Conclusion: 1. We have revealed an increase in secondary amyloidosis frequency in RA patients over the studied period of time from 40% to 58% ($p=0.041$, Fisher's exact test) while ESRD as a cause of death in RA patients decreased from 17.3% to 4% ($p=0.023$, Fisher's exact test). 2. Secondary amyloidosis is the most common type of renal involvement in RA according to the autopsy data.

REFERENCES

- [1] Makino H. et al. // *Mod. Rheumatol*. 2002;12(2):148-54.
- [2] Icardi A. et al. // *Reumatismo*. 2003;55(2):76-85.

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AB0280

DIFFERENCE BETWEEN PATIENT'S GLOBAL HEALTH AND PATIENT'S GLOBAL ASSESSMENT OF DISEASE ACTIVITY, AND DIFFERENT FACTORS INFLUENCE ON THESE SCALES IN RHEUMATOID ARTHRITIS PATIENTS

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Background: Evaluation of rheumatoid arthritis (RA) activity is crucial measurement in achieving remission or low disease activity. Visual analogue scale (VAS) by patient's evaluation has been used for the outcome measure for RA patients because of its feasibility, reliability, sensitivity to change, and it directly reflects the patient's overall perspective. Patient's evaluation is a component of multiple composite indices used in assessing RA activity and treatment response. There are two measurements that patient's evaluation. One is patient's global assessment of disease activity (PtGA), and the other is patient's assessment of global health (PtGH)¹. PtGA was originally developed as a component of American College of Rheumatology Core Set and used for Simplified Disease Activity Index (SDAI) and Clinical Disease Activity Index (CDAI); while PtGH was originally developed as a component of 28-joint Disease Activity Score (DAS28). PtGA and PtGH have been considered equivalent in a

large scale of study²⁾. In daily practice or observation, "patient's VAS" is usually used without specifying whether it refers to PtGA or PtGH. The factors which influence the change in PtGA or PtGH have not been demonstrated concomitantly in daily practice.

Objectives: We investigated the difference between PtGA and PtGH, especially each change obtained after intensification of treatment in 12 weeks and identified the factors that influence on each measurement in RA patients.

Methods: Consecutive patients were enrolled to this retrospective study at our hospital from October 2017 to September 2018. Demographic and clinical data at enrollment as well as treatment regimens were collected by review of medical charts. At first, we examined the baseline data and the changes in 12 weeks of PtGA and PtGH in their relations. The second, we divided those patients into two subsets according to medications intensified by methotrexate (MTX) subset and biological disease-modifying antirheumatic drugs (DMARDs) or janus kinase (JAK) inhibitor (B/J) subset. We compared the difference of the changes in PtGA from the baseline to 12 weeks (Δ PtGA) and those in PtGH (Δ PtGH) between MTX subset and B/J subset. Finally, the logistic regression analysis was performed to identify factors that differently influence for each scale in 12 weeks.

Results: Consecutive 38 RA patients were enrolled. Women were 76%. The median age [IQR] was 66.5 [55-75] years old. Disease duration was 2.5 [1-15] years. DAS28 was 2.61 [2.02-3.17]. SDAI was 16.8 [11.1-24.6] and CDAI was 15.3 [9.38-23.9]. MTX was initiated or increased in 24 patients (63%). The baseline median dose of MTX was 6 [3.5-8] mg/week. Biologics or JAK inhibitor were initiated in 8 patients (21%); tocilizumab (n=5), golimumab (n=1), abatacept (n=1) and tofacitinib (n=1). Other DMARDs were used in 6 patients (16%). Δ PtGH in 12 weeks was -1.68 ($p<0.01$), and Δ PtGA in 12 weeks was -2.22 ($p<0.01$). Δ PtGH and Δ PtGA correlated significantly ($r=0.785$, $p<0.01$). Δ PtGA in MTX subsets was not different from that in B/J subsets in ($p=0.50$) and Δ PtGH was not either ($p=0.57$). No significant improving factor in Δ PtGA was identified, whereas ($p<0.05$) and usage of steroid ($p<0.01$) were improving factors in Δ PtGH.

Conclusion: Intensification of treatment significantly improved in both Δ PtGA and Δ PtGH but we need to pay attentions that there were different improving factors between these two patient's measurement.

REFERENCES

- [1] Koevoets R, et al. Simplified versions of the original disease activity score: validation in BeSt trial. *Ann Rheum Dis* 2011; 70: 1471.
- [2] Khan NA, et al. Patient's global assessment of disease activity and patient's assessment of general health for rheumatoid arthritis activity assessment: are they equivalent? *Ann Rheum Dis* 2012; 71: 1942.

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AB0281 UTILIZATION OF SMART PHONE APPLICATION TO ASSESS THE DISEASE OUTCOMES IN RHEUMATOID ARTHRITIS: SMART- RA STUDY

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Background: Rheumatoid arthritis (RA) is a chronic inflammatory disorder which if not managed properly leads to joint destruction, disability, poor quality of life and premature mortality. Disease modifying antirheumatic drugs (DMARDs) have considerably improved disease outcome in RA. However, poor patient compliance significantly limits the benefits that could be accrued from DMARDs. In a technology driven era, with more people having access to smart phones, unique opportunities exist for use of phone-based technologies to improve patient care in chronic diseases. This study aims to investigate whether the use of HealthCius smart phone application for self management can influence quality of life for patients with RA and improve inflammatory disease activity.

Objectives: To investigate the impact of smart phone application (HealthCius) on inflammatory disease activity and quality of life in RA.

Methods: 38 RA patients fulfilling the 2010 Rheumatoid Arthritis Classification Criteria were recruited. Subjects were randomized into 2 groups. First, having access to a smart phone were assigned to the intervention group using the HealthCius application (n=23) and second, the control

group not using the application (n=15). The patients in two groups received standard treatment of RA. The application was designed after obtaining feedback from health care providers, patient counselors and RA patients using a questionnaire. To the patients, the app was their individual treatment plan. It helped them comply with the plan by providing an easy to refer checklist, reminders, alerts and a visual dashboard of their progress through the day. The app served as the doctor's virtual assistant inside the patient's smart phone. For the doctor, it was a live dashboard of all patients and their real time compliance levels. The data reported by the patients was available to the doctor in the form of time sliced charts and trend lines. Therefore, this app is designed to leverage technology to shift the patients' focus every day on to their treatment plan thereby driving up compliance and better health outcomes. Outcome measures included erythrocyte sedimentation rate (ESR), C-Reactive protein (CRP), disease activity score (DAS28) and health assessment questionnaire (HAQ-DI) at baseline and at 12 weeks.

Figure 1

Results: Baseline characteristics were similar between groups with no significant difference. There was a significant difference between the control and intervention group for DAS28 ($p<0.05$), ESR ($p<0.05$), CRP ($p<0.05$) and HAQ-DI ($p<0.05$) after 12 weeks in favor of smart phone application. Analysis within the groups revealed significant improvement in DAS28 ($p<0.05$) (Fig.1A), ESR ($p=0.01$) (Fig.1B), CRP ($p=0.001$) (Fig.1C) and HAQ-DI ($p=0.01$) (Fig.1D) in the application group as compared to control group. Impact of DMARDs usage was also evaluated at the end of the study and it was found that the average drug usage of DMARDs was more in control group than the intervention group.

Conclusion: The study suggested that there was greater improvement in inflammatory disease activity and quality of life in smart phone application assisted RA patients suggesting that smart phone technology can be used to leverage health benefits in RA.

REFERENCE

- [1] Azevedo R, Bernardes M, Fonseca J, Lima A. Smartphone application for rheumatoid arthritis self-management: cross-sectional study revealed the usefulness, willingness to use and patients' needs. *Rheumatol Int*. 2015 Oct; 35(10):1675-85. doi: 10.1007/s00296-015-3270-9. Epub 2015 Apr 24.

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AB0282 SYSTEMATIC REVIEW OF STUDIES REPORTING ON COGNITIVE FUNCTION IN RHEUMATOID ARTHRITIS COMPARED TO THE GENERAL POPULATION

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Background: Rheumatoid arthritis (RA) patients often complain of "brain fog" as a symptom when their disease activity is greater. The exact areas of cognition that this "brain fog" means are not yet understood. Previous studies have found that people with RA have lower cognitive function (CF) than healthy controls and age based population norms. A study by Shin et al which looked at prevalence of cognitive impairment