large scale of study[2)]. 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 (ΔPtGA) and those in PtGH (ΔPtGH) 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%). ΔPtGH in 12 weeks was -1.68 (p<0.01), and ΔPtGA in 12 weeks was -2.22 (p<0.01). ΔPtGH and ΔPtGA correlated significantly (r=0.785, p<0.01). ΔPtGA in MTX subsets was not different from that in B/J subsets in (p=0.50) and ΔPtGH was not either (p=0.57). No significant improving factor in ΔPtGA was identified, whereas, woman (p<0.05) and usage of steroid (p<0.01) were improving factors in ΔPtGH.

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

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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.

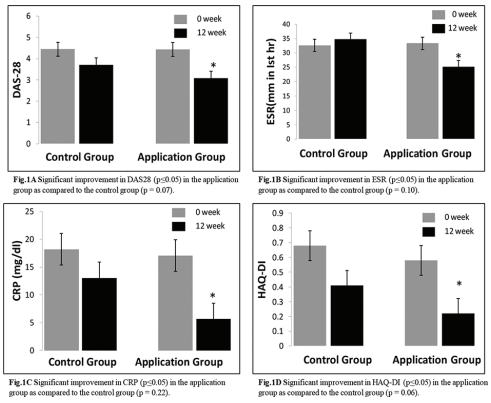

Fig.1A Significant improvement in DAS28 (p≤0.05) in the application group as compared to the control group (p = 0.07).

Fig.1B Significant improvement in ESR (p≤0.05) in the application group as compared to the control group (p = 0.10).

Fig.1C Significant improvement in CRP (p≤0.05) in the application group as compared to the control group (p = 0.22).

Fig.1D Significant improvement in HAQ-DI (p≤0.05) in the application group as compared to the control group (p = 0.06).

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≤0.5) 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.

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AB0282 SYSTEMATIC REVIEW OF STUDIES REPORTING ON COGNITIVE FUNCTION IN RHEUMATOID ARTHRITISCOMPARED 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

in persons with RA found that 31% of their 115 person sample was cognitively impaired and stated that further studies should be done to identify the specific domains of cognitive function that are most commonly affected (1). In this project, I will be looking at and summarizing all the data and findings that have been collected and reported on CF in the RA population and seeing which domains of cognition differ and which do not differ when compared to the general population and aged based population norms.

Objectives: To conduct a systematic review of studies reporting on cognitive function (CF) in rheumatoid arthritis (RA) patients compared to non-RA populations (based on comparison with a control group or age-based population norms).

Methods: We conducted a comprehensive literature search of MEDLINE, EMBASE, and PUBMED databases using the following search terms: rheumatoid arthritis or arthritis or inflammatory arthritis, and cognitive function or cognition. The search was conducted with no limit for years, and confined to only articles in English or French. After title and abstract screen, relevant articles were selected for review. Only full length articles were considered. Study selection criteria included: 1) must be presenting original data, 2) must contain RA group with confirmed diagnosis, 3) must be reporting on CF in RA, 4) must use a validated measure of CF (self-reported or from conducting CF tests), and 5) must contain a healthy control group or age-based populations norms. Selected articles were critically appraised using the SIGN Methodology Checklist and data extracted using a standardized form.

Results: Our initial literature search yielded 747 titles, and after screening for irrelevant titles and duplicates, 28 abstracts remained. Upon excluding non-full length articles and articles which did not report on CF, 13 abstracts remained. Of these 13 articles, 8 met our selection criteria. All studies were published after the year 2000, 3 were from the USA, 1 from Canada, 1 from the UK, 1 from Australia, 1 from Egypt, and 1 from Taiwan. Sample sizes for RA and control groups varied from 15 to 120. Of these 8 articles, 6 found a significant difference in cognitive function in the RA group compared to control group or age-based population norms in at least one domain of CF. All articles that found a significant difference in CF used standardized neuropsychological tests. Domains of CF that differed included fluency, attention, visual-spatial learning, memory, decision making time, and simple reaction time. Domains of CF that were not found to differ from general population across all studies included reasoning, comprehension, and intelligence (IQ).

Conclusion: Overall, 75% of the articles reviewed found a significant difference in at least one domain of CF in RA patients compared to healthy controls or age-based population norms. The domains of CF most commonly affected are those related to processing and speed rather than intellectual ability. Further studies are needed to explore these differences in greater depth and to understand the underlying reasons for these differences.

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AB0283 IDENTIFICATION OF NEW AUTOANTIBODIES FOR RHEUMATOID ARTHRITIS USING HUMAN PROTEOME MICROARRAYS

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Background: Rheumatoid arthritis is an autoimmune disease characterized by symmetrical small arthritis. Anti-cyclic citrullinated peptide antibodies and rheumatoid factor are commonly used to diagnose RA[1]. However, the early diagnosis of RA is sometimes difficult, due to the heterogeneity and negative anti-CCP antibody or RF in some patients. Therefore, it is urgent to find autoantibodies with high sensitivity and specificity as diagnostic markers for RA.

Objectives: To screen autoantibodies of RA with high sensitivity and specificity using human proteome microarrays[2].

Methods: Firstly, a case-control method was used to analyze the serum antibodies of RA patients using human proteome microarray which composed of 20,000 proteins, and identified RA-related antibodies. Then, expanded the sample size and analyzed the expression of these candidates between RA patients and healthy controls.

Results: The serum of five RA patients and five healthy controls were selected to detect the RA-related autoantibodies by microarray, and 25 candidates were screened. Then the IgG and IgM RA-focused microarrays composed of the 25 proteins were screened with additional cohorts of 72 RA patients and 106 healthy controls. The results of IgG protein microarray showed: (1) Expression of these 25 autoantibodies in RA patients was significantly higher than those in healthy controls (P<0.05). (2) There was nodifferentially expressed protein between anti-CCP antibody and RF-negative RA patients (n=18) and anti-CCP antibody and/or RF-positive RA patients (n=54) (P>0.05). (3) ROC analysis showed that the combination of anti-RBPJ, anti-SH3BGR and anti-PAFAH1B3 autoantibody can be highly RA-specific biomarkers, with 66.7% sensitivity and 74.2% specificity, and the area under the curve is 0.734; meanwhile the sensitivity and specificity of the anti-CCP antibody and RF-negative RA patients diagnosis were 77.8% and 65.6%, and the area under the curve was 0.720. The results of IgM protein microarray showed: (1) Only 10 out of the 25 candidates’ expression was significantly higher in RA patients than healthy controls (P<0.05). (2) Compared with anti-CCP antibody and/or RF-positive patients, the expression of anti-PAFAH1B3, anti-RBPJ, anti-SH3BGR, anti-UBA5, anti-ANP32A, anti-PAGE2, anti-SHFM1 and anti-PDE1B was found significantly higher in anti-CCP and RF-negative patients (P<0.05). (3) ROC analysis showed that anti-PAFAH1B3 antibody was identified to diagnose RA with 76.2% sensitivity and 72.9% specificity, and the area under the curve was 0.768; however, there were no significance for the diagnosis of anti-CCP antibody and RF-negative RA patients (P=0.160).

Conclusion: The combination of IgG-type antibodies anti-RBPJ, anti-SH3BGR and anti-PAFAH1B3, the IgM-type antibody anti-PAFAH1B3 as well, has high sensitivity and specificity for the diagnosis of RA; especially the IgG-type autoantibody combination has great value for the diagnosis of anti-CCP and RF-negative RA patients.

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AB0284 HEMATOLOGICAL MARKERS OF SYSTEMIC INFLAMMATION CORRELATE WITH CLINICAL, LABORATORY AND ULTRASOUND DISEASE ACTIVITY PARAMETERS IN RHEUMATOID ARTHRITISPATIENTS

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Background: An accurate measurement of disease activity and inflammation is essential for customizing the most appropriate management and treatment strategy in patient with rheumatoid arthritis (RA). Current data suggest that hematological markers of systemic inflammation [peripheral blood neutrophil-to-lymphocyte (NLR), platelet-to-lymphocyte (PLR) and monocyte-to-lymphocyte (MLR) ratios] could be used as novel, sensitive measures of inflammatory response, additionally to conventional laboratory and clinical markers [erythrocyte sedimentation rate (ESR), C-reative protein (CRP), Disease Activity Score of 28 joints (DAS28), tender joint count (TJC), swollen joint count (SJC)]. The ultrasonography US) of joints enables the disease activity assessment by quantifying thickening and vascularity of the synovium.