This finding, and its cost-effectiveness, should be validated in a clinical study.

REFERENCES


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The Impact of Different Criteria Sets on Early Remission and Identifying its Predictors in Rheumatoid Arthritis: Results from an Observational Cohort (2009–2018)

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Background: Currently, with increased awareness of early diagnosis and intervention and the identified association of early remission with a better clinical outcome in patients with rheumatoid arthritis (RA), shorter time to remission appears to be a more attractive goal. There are several studies reported the prevalence of early remission, no study so far has demon- strated the issue in Chinese population. Moreover, further investigative studies need to be performed due to limited and conflicting predictors of early remission in previous studies.

Objectives: To assess rates of early remission and investigate the concordance across different remission definitions, and to identify predictors of early remission in Chinese patients with RA.

Methods: For this study, clinical records were retrospectively reviewed for RA patients at rheumatologic clinic in Peking University First Hospital from 2009 to 2018. Disease activity and remission were determined according to DAS28-ESR, CDAI, SDAI, and Boolean criteria. Early remis- sion was defined as time to remission ≤6 months. A secondary defini- tion evaluated early remission as ≤3 months. Logistic-regression analyses were performed to identify determinants of early remission.

Results: 869 consecutive patients contributing 8,640 clinic visits were studied. Early remission rates were respectively 42.0% (DAS28-ESR), 25.0% (CDAI), 29.4% (SDAI), and 26.1% (Boolean). Notably, patients achieving remission within 6 months more frequently attained sustained remission by contrast to those not achieving early remission (88.7-75.1% vs. 31.2-33.1%, P<0.0001). Further logistic-regression analyses revealed male (OR=1.42-1.74, p<0.05), early RA (OR=1.64-2.22, p<0.05), as well as initial hydroxychloroquine treatment (OR=1.41-1.81, p<0.05) were inde- pendently associated higher probability of early remission, as demon- strated by nearly all definitions, while a higher baseline disease activity (DAS28-ESR, CDAI, and SDAI) lowered the possibility of early remission in corresponding remission indices. However, the significant associations of treatment-naïve, serological features with early remission were not confirmed.

Conclusion: Early remission was strongly associated with sustained remis- sion, however infrequently achievable in real-life practice. Male, early RA, a low baseline disease activity, and initial hydroxychloroquine treatment were stable independent predictors of early remission.

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CREATE RISK PREDICTION MODELING AND DRUG WITHDRAW ROAD MAP THROUGH PATTERN EXTRACTION AND DATA MINING: A MASTER ALGORITHM DEVELOPMENT FROM THE SMART SYSTEM OF DISEASE MANAGEMENT (SSDM)

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Background: Combination therapy with DMARDs for treating RA is standard of care. However, certain rates of adverse events (AEs) are unavoidable. The stigmas are how to predict the risk and how to define drug withdrawal sequence if AEs persist for optimal risk reductions. The decisions made are always empirically.

Objectives: To develop a risk prediction model and an algorithm for drug withdrawal sequence based on data mining from the SSDM.

Methods: SSDM is an interactive mobile disease management tool, including two application systems (APPS) for both the doctors and the patients. The patients can input medical records (including medication and laboratory test results) and perform self-evaluation (DASS28, HAQ) via App. The data synchronizes to mobiles of authorized rheumatologists through cloud and advices could be delivered. In previous studies, we demonstrated that patients could master SSDM after training. In order to develop a prediction model and the master algorithm, abnormal white blood cell counts (WBC) and alanine aminotransferase (ALT) elevation were targeted. Data was collected, extracted, validated, and Bayesian networking, an artificial intelligent system in assisting clinical forecast and decision-making may be achieved with SSDM.

Results: From Jun 2014 to Jan 2019, 44,533 RA patients from 587 centers registered in SSDM. 135 different drugs and 882 combination therapies are identified. LP happens at 317 and IP at 286, ALT at 322 cases in 641 treatment regiments. Among them, MTX based regiments are 257 types, and the risk ratio (RR) are profiled as prediction model by comparing each AE rate of combination regiment with that of MTX monotherapy (Fig 1). The RR ranges from 0.28 to 6.28. The highest risk combination of prednisone (Pred), leflunomide (LEF), methotrexate (MTX), hydroxychloroquine (HCO) and Celecoxib is selected (RR=6.28) to develop a master algorithm. Figure 2 shows Bayesian network, in which, quartet correlaties with 31 different regiments. Based on Bayesian method, the probabilities of LP, IP and ALT are plotted through 64 modeling, and the algorithm for drug withdraws strategies is generated. Drug withdrawing sequence for LP is HCO, then Pred, then LEF, the risks of LP are reduced by 45%, 28%, 23% and 4%, respectively. For IP, withdrawal sequence is Pred, then LEF, then HCO, the risks of IP are reduced by 45%, 28%, 23% and 4%, respectively. For ALT, withdrawal sequence is MTX, then Pred, LEF, then Cel, the risks of ALT are reduced by 48%, 8%, 7%and 6%.

Conclusion: Through patterns extraction, data mining, modeling, and Bayesian networking, a risk prediction model and a master algorithm for drug withdraw strategy in reduction of AEs are developed, which are expendable and replicatable. Via continuing data inputs and machine leaning, an artificial intelligent system in assisting clinical forecast and decision-making may be achieved with SSDM.