DEVELOP A REPLICABLE MODEL FOR RATIONAL SELECTION OF STRATEGIES IN TREAT-TO-TARGET AND MAINTAIN-BEING-TARGET: REAL WORLD DATA MINING VIA SMART SYSTEM OF DISEASE MANAGEMENT (SSDM)

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Background: Daily health care in the real world is different from a clinical trial setting, which deals with a wide spectrum of RA patients from statuses of remission to disease activities at mild, moderate and severe based on DAS28. Due to lack of information and knowledge about optimal regiments for both treat-to-target (T2T) and maintain-being-target (MbT), physicians make choices on treatment strategies based on their own experience or intuition.

Objectives: To develop a replicable model for rationalizing the strategies for T2T and MbT using data mining via smart system of disease management (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 (DAS28, 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. Up to January of 2019, totally 106,647 patients with rheumatic diseases using SSDM, among them, 36% are RA patients who receive more than 1,400 different regiments of treatments. Here we select MTX, Hydroxychloroquine (HCQ) and prednisone (GS) based therapies for model development.

Results: Totally 1,571 patients were treated with MTX (640), HCQ (397), GS (131), MTX+HCQ (253), MTX+GS (47), HCQ+GS (61), MTX+HCQ+GS (42), respectively. Among the patients whose DAS28=3.2 at baseline, 72% with MTX, 75% with HCQ, 78% with MTX+HCQ and 73% with MTX+HCQ+GS are MbT (DAS28=3.2) after 6 months, which are significantly different comparing with those 52% with GS, 57% with MTX+GS and 57% with HCQ+GS (p<0.01). Among the patients whose DAS28=5.1 at baseline, 81% with GS, 72% with MTX+GS and 100% with HCQ+GS achieved T2T (DAS28=3.2) after 6 months, which is significantly different compared to 25% with MTX, 24% with HCQ, 45% with MTX+HCQ and 37% with MTX+HCQ+GS (p<0.01). Among the patients whose DAS28=5.1 at baseline, there is no statistic significant differences for the rates of achieving T2T, which ranges from 39% to 50% across all the 7 regiments.

Conclusion: With MTX, HCQ and GS based regiments in RA, the rational selections of strategies for MbT are monotherapy with MTX, HAQ, or MTX+HCQ, strategies for T2T on high disease activity group are GS, GS+MTX or GS+HCQ. In view of 1,400 regiments with clinical outcomes being available in SSDM, the model developments can be replicated in rationalizing strategies through data mining.

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REFERENCES