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AB1243

TRAINING AND VALIDATION OF A MULTIVARIATE PREDICTOR OF RISK OF RADIOGRAPHIC PROGRESSION FOR PATIENTS WITH RHEUMATOID ARTHRITIS

T. Huizinga¹, M. E. Weinblatt², N. Shadick², C. Heegaard Brahe³, M. Østergaard³, M. L. Hetland³, S. Saevardottir⁴, M. Horton⁵, B. Mabey⁵, D. Flake⁵, R. Ben-Shachar⁵, E. Sasso⁶, A. Gutin⁵, E. Hliraya⁶, J. Lanchbury⁵, J. Curtis⁷. ¹Leiden University, Leiden, Netherlands; ²Brigham and Women's Hospital, Boston, United States of America; ³Center for Rheumatology and Spine Diseases, Rigshospitalet, Glostrup, and Department of Clinical Medicine, University of Copenhagen, Copenhagen, Denmark; ⁴Rheumatology Unit, Department of Medicine, Solna and Institute of Environmental Medicine, Karolinska Institutet, Stockholm, Sweden; ⁵Myriad Genetics, Inc., Salt Lake City, United States of America; ⁶Crescendo Bioscience, Inc., South San Francisco, United States of America; ⁷University of Alabama at Birmingham, Birmingham, United States of America

Background: The multi-biomarker disease activity (MBDA) score, adjusted for age, sex and adiposity (MBDA_{adj}), has been shown to be better than several conventional disease activity measures for predicting risk for radiographic progression (RP) in patients with rheumatoid arthritis (RA).¹ Serologic status and other non-disease activity measures are also predictive of RP risk. Combining them with the MBDA_{adj} should result in a stronger prognostic test for RP than any one measure alone.

Objectives: Develop a multivariate model for predicting risk for RP that includes the adjusted MBDA score and other known predictors of RP.

Methods: Four RA cohorts were used, two for training (OPERA and BRASS, n=555) and two for validation (SWEFOT and Leiden, n=397). Each pair of cohorts was heterogeneous in disease duration and treatment history. BMI data were not available for one validation cohort, so a BMI surrogate was modeled using forward selection with the two training cohorts and 3 others (CERTAIN, InFoRM, RACER) (N=1411). An RP risk score was then trained using forward selection in a linear mixed-effects regression, considering disease-related and demographic variables as predictors of change in modified total Sharp score over one year (Δ mTSS), with a random effect on cohort. The RP risk score was validated as a predictor of RP with two cutoffs (Δ mTSS >3 and >5) using logistic mixed-effects regression. Odds ratios (OR) and 95% profile likelihood-based confidence intervals (CI) were calculated from the models and significance was assessed by likelihood ratio tests. Risk curves were generated to show probability of RP as a function of the RP risk score.

Results: The BMI surrogate included leptin, sex, age and age² and correlated well with BMI ($p = 0.76$). In training, the most significant independent predictors of RP were MBDA_{adj} ($p = 0.00020$), seropositivity ($p = 9.3 \times 10^{-5}$), BMI surrogate score ($p = 0.013$) and use of targeted therapy ($p = 0.0026$). The final model was: RP risk score = $0.024 \times \text{MBDA}_{\text{adj}} + 0.093$ if seropositive - $0.063 \times \text{BMI}$ surrogate score - 0.61 if using a targeted therapy. In validation, the OR (95% CI) of the RP risk score for predicting Δ TSS >3 or >5 were 2.2 (1.6, 3.2) ($p = 2.6 \times 10^{-6}$) and 3.1 (2.0, 5.0) ($p = 5.7 \times 10^{-8}$), respectively (Figure 1). The odds of a patient having RP increases by 50% for each 21-unit or 15-unit increase in MBDA_{adj} for RP defined as Δ TSS >3 or >5, respectively.

Validation of the RP Risk Score

Figure 1.

Conclusion: A multivariate model containing adjusted MBDA score, seropositivity, a BMI surrogate and use of targeted therapy has been trained and validated as a prognostic test for radiographic progression in RA.

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AB1244

PROGNOSTIC FACTORS IN IGG4-RELATED DISEASE: A LONG-TERM MONOCENTRIC CHINESE COHORT STUDY

Z. Ji¹, L. Ma¹, L. Zhang¹, L. Ma¹, D. Liu¹, Y. Sun¹, X. Kong¹, X. Dai¹, R. Chen¹, H. Chen¹, L. Jiang¹. ¹Zhongshan Hospital, Fudan University, Shanghai, China

Background: Through initial response to treatment with GC, the patients with IgG4-related disease (IgG4-RD) exhibited high relapse rate after reduction or withdrawal of GC treatment, indicated the unsatisfactory prognosis for IgG4-RD. It is of clinical significance to develop new informative risk factors for refractory and relapsed disease.

Objectives: To evaluate the prognosis of IgG4-RD and identify predictive factors for treatment resistance and disease relapse in a Chinese cohort.

Methods: 102 patients newly diagnosed with IgG4-RD were followed for 6-111 months. Clinical data were compared between patients whose disease went into remission and those who suffered refractory or relapsed disease. Predictive factors for refractory and relapsed disease were calculated by univariate analysis.

Results: Among the 78 patients who received medical treatment with regular follow-up, 55 (59.8%) patients sustained clinical remission, and 23 (25%) patients suffered refractory or relapsed disease. The mortality and incidence of malignancy were both 4.35% during follow-up. Serum TNF- α ≥ 13 pg/ml, sIL-2R ≥ 1010 pg/ml, TC < 3.55 mmol/L, LDL < 2.0 mmol/L, IgG > 20.2 g/L, GC withdrawal, and treatment without immunosuppressor (IM) during the maintenance period (OR 3.23) were predictive factors for refractory and relapsed IgG4-RD. The combination of GC and IM treatment was protective (OR 0.338) against refractory and relapsed IgG4-RD.

Conclusion: Serum TNF- α , sIL-2R, LDL, TC, IgG, GC withdrawal, and treatment without IM during the maintenance period were predictive factors for refractory and relapsed IgG4-RD. Treatment with GC and IM may protect against refractory and relapsed IgG4-RD.

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AB1245 DAILY MANAGEMENT OF PATIENTS WITH AXIAL SPONDYLOARTHRITIS: SELF-MONITORING OF DISEASE ACTIVITY WITH A SMARTPHONE APP IS FEASIBLE – A PROOF OF CONCEPT STUDY

U. Kiltz¹, R. Kempin¹, A. Schlegel¹, X. Baraliakos¹, S. Tsiami¹, B. Buehring¹, D. Kiefer¹, J. Braun¹ on behalf of n/a. ¹Rheumazentrum Ruhrgebiet Herne and Ruhr University Bochum, Herne, Germany

Background: Assessment and monitoring of disease activity and functioning is of major importance for the course of axial spondyloarthritis (axSpA). This is equally important for patient monitoring in daily routine as also for tight control strategies. Even though there is evidence that a closer monitoring of patients is better than routine care, more intensive treatment schedules are often not realized in daily practice for several reasons including shortage of time and personal resources. Using application software devices (apps) in clinical routine for the recording of disease-specific patient reported outcomes (PRO) may facilitate monitoring and improve clinical decision processes but there is a lack of data on the use of apps.

Objectives: To investigate the use of such App technology in respect to usability, feasibility and equivalence of data in daily care of patients with axSpA. In more detail, it will be first determined how many patients are capable and ready to use the technology in a routine setting. Furthermore, the usage and behavior of patients using the app will be studied, the usability of the app and the equivalence of the collected parameters as well as the adherence to the documentation of disease activity over time.

Methods: Patients diagnosed with axSpA were consecutively included in this ongoing monocentric prospective cohort study. In addition to patient and disease characteristics, information on previous experience with digital health apps was collected. Patients were asked to submit BASDAI and BASFI scores regularly every 2 weeks. The free to use AxSpA Live App is available for Android and iOS as a Class I certified medical device.

Results: Out of 103 axSpA patients asked, 69 patients with axSpA (mean age 41.5 ± 11.3, 58% male, 76.8% use of bDMARDs, BASDAI 4.3 ± 2.0, BASFI 3.8 ± 2.5) out of 103 patients (67%) agreed to use participate, while 5 did not have a smartphone, 1 was unable to download the app for technical reasons, 28 reported other personal reasons). Of the 69, 62 patients (89.9%) reported using electronic media frequently and had used digital health apps (mean apps used 1.0 ± 1.3) in everyday life before. There were no systematic differences between pain levels documented on paper or by app at baseline (ICC 0.9 (95%CI 0.82 – 0.93). Out of 55 patients who completed week 2, only 33 patients (60%) used the App regularly to transmit their BASDAI/BASFI responses within the first two weeks (60%). Patients who started a new drug treatment because of high disease activity, reported BASDAI values more often than patients without a treatment change within a follow-up period of 5.5 ± 2.4 weeks (Table).

Conclusion: The majority of patients with axSpA were able to use the AxSpA Live App. Most patients report scores regularly. The current disease activity seems to influence the adherence to reporting.

	Patients without change in their medication (n=53)	Patients with change in their medication (n=16)
Age, years	42.0 (11.9)	39.8 (9.3)
Sex, male (%)	62.3	43.8
BASDAI, baseline	4.1 (2.1)	4.9 (1.7)
BASFI, baseline	3.8 (2.6)	3.8 (2.3)
Time of follow-up, in weeks	5.4 (2.4)	5.6 (2.5)
Number of transmitted BASDAI values at week 2	22 (41%)	11 (69%)
Median number of transmitted BASDAI values during follow up	1.0(3.6)	1.5 (1.4)

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AB1246 IDENTIFICATION OF GIANT CELL ARTERITIS IN REAL-WORLD DATA USING AN ADMINISTRATIVE CLAIMS-BASED ALGORITHM

H. Lee^{1,2}, S. Chen^{1,2}, S. Tedeschi², P. Monach², J. Liu¹, A. Pethoe-Schramm³, Y. Vau⁴, S. Kim^{1,2}. ¹Brigham and Women's Hospital, Division of Pharmacoepidemiology & Pharmacoeconomics, Boston, United States of America; ²Brigham and Women's Hospital, Division of Rheumatology, Immunity and Inflammation, Boston, United States of America; ³F. Hoffmann-La Roche, Basel, Switzerland; ⁴Genentech, San Francisco, United States of America

Background: Giant cell arteritis (GCA), the most common systemic vasculitis in adults, is often associated with significant morbidity and mortality. A claims-based algorithm that accurately identifies GCA patients in large real-world data can offer new opportunities for future epidemiological studies.

Objectives: We aimed to develop and validate a claims-based algorithm for GCA.

Methods: We developed and tested 5 claims-based GCA algorithms using U.S. Medicare claims (Parts A/B/D) linked to electronic medical record data from a large academic medical center, 2006-2014: **Algorithm 1)** ≥1 International Classification of Diseases, Ninth Revision (ICD-9) code for GCA (446.5x) by any physician, high dose steroid dispensing (i.e., prednisone equivalent ≥40 mg/day for ≥14 days), and ≥1 Current Procedural Terminology (CPT) code for ESR/CRP; **2)** ≥1 ICD-9 for GCA by a rheumatologist, high dose steroid dispensing, and ESR/CRP; **3)** ≥2 ICD-9 for GCA by a rheumatologist separated by 7-30 days and high dose steroid dispensing; **4)** ≥1 ICD-9 for GCA by a rheumatologist, high dose steroid dispensing, ESR/CRP, and CPT code for temporal artery biopsy; and **5)** ≥1 ICD-9 for GCA or its subtypes (447.6, 437.4, 417.8) by a rheumatologist, high dose steroid dispensing, ESR/CRP, and CPT code for chest imaging. For all algorithms, the index date was defined as the date of first steroid dispensing. Two physicians reviewed medical records for the gold standard definition of GCA: documentation of GCA by the treating physician or a temporal biopsy result consistent with GCA. Probable GCA cases based on treating physician's records were included as well. Positive predictive value (PPV) and 95% confidence intervals (CI) of the algorithms were calculated.

Results: We identified 1,930 patients with Medicare claims data linked to electronic medical records. Among these, 799 unique records with physician notes