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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

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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

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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

documenting GCA or biopsy results were included in the PPV calculations. Algorithm 1, which identified the greatest number of patients (n=896), yielded the lowest PPV of 60.7%. Algorithms 4 and 5, which required disease-specific workups (temporal artery biopsy or chest imaging), mildly improved the PPV to 76.2% and 68.2%, respectively. The PPV was highest in algorithm 3 (84.8%), which required 2 or more diagnoses of GCA by a rheumatologist in addition to high dose steroid dispensing.

Table. PPV of Claims-based Algorithms

Algorithm #	No. of patients			
	Records Identified	Records Reviewed	Adequate Records	PPV* (95% CI)
1	896	446†	206 (46.2%)	60.7% (53.7-67.4)
2	471	471	270 (57.3%)	78.6% (73.2-83.3)
3	220	220	125 (57.4%)	84.8% (77.3-90.6)
4	296	296	172 (58.1%)	76.2% (69.1-82.3)
5	47	47	26 (55.3%)	68.2% (48.2-85.7)

* True positive cases included both definitive and probable GCA patients

†446 records were randomly selected for chart review.

Conclusion: A claims-based algorithm including two or more diagnosis codes for GCA by a rheumatologist separated by 7-30 days and high dose steroid dispensing (prednisone equivalent ≥ 40 mg/day for ≥ 14 days) can be a useful tool for identifying patients with GCA, allowing for future large real-world data studies.

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AB1247 ELEVATED SERUM COMPLEMENT (C3/C4) LEVEL AS AN INFLAMMATORY MARKER FOR INFECTION IN PATIENTS WITH FEVER: A RETROSPECTIVE STUDY

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Background: The functions of the complement system are to protect the host against infection, clearance of immune complexes, and regulate adaptive immunity after activation by C-reactive protein (CRP) or foreign cells.¹ C3 and C4 may increase up to 50 percent of baseline values as part of the acute-phase response, which is an expected host response for infection and injury.²

Objectives: We aimed to examine the correlation between elevated C3/C4 levels and the underlying causes (infectious vs. non-infectious) of fever (subjective and/or objective) in adults admitted to Community Regional Medical Center (CRMC).

Methods: This is a retrospective study of C3/C4 level that was ordered in adult patients who were admitted to CRMC in April 1st, 2018 to September 30th, 2018 with fever. This was also analyzed in comparison to elevated lactic acid, erythrocyte sedimentation rate (ESR), and CRP level.

Results: Complement levels were ordered in 210 patients admitted to CRMC medicine or intensive care units. Among these patients, 28.09% (59/210) were diagnosed with various infectious diseases confirmed by gold standard methods (cultures, serology tests, computerized tomography, or magnetic resonance imaging), regardless of fever status during admission.

About 26.6% (56/210) had subjective or objective (temperature greater than 100.4 F or above), and 52 of them had complement levels (C3/C4) ordered with resulted in either normal or elevated. Within these 52 patients, lactic acid, ESR, and CRP were ordered in 33, 28, 25 of them respectively.

Table 1. Elevated C3/C4 level vs. normal C3/C4 level in detecting infection in fever patients when tested against gold standards.

	Patients with infectious disease diagnosis	Patients without infectious disease diagnosis	
Elevated C3 or C4 or both (screen test +)	13	7	Positive predictive value (PPV) =13/20=65%
Both normal C3 and C4 (screen test -)	8	24	Negative predictive value (NPV) =15/32=46.9%
Sensitivity=13/21=61.9% Specificity=24/31=77.4%			

Table 2. Sensitivity, specificity, PPV, NPV, likelihood ratio positive (LR+), and likelihood ratio negative (LR-) among C3/C4, lactic acid, ESR, CRP/CRPH in detecting infection in patient with fever

	C3/C4 (N=52)	Lactic Acid (N=33)	ESR (N=28)	CRP/CRPH (N=25)
Sensitivity	61.9%	50%	90%	100%
Specificity	77.4%	91.3%	11.1%	11.8%
PPV	65%	71.4%	36%	34.8%
NPV	48.9%	80.8%	66.6%	100%
LR+	2.7	5.7	1.0	1.1
LR -	0.49	0.55	0.9	0

Conclusion: Complement levels can be used as a rapid screening test to guide infection consideration as it correctly identified 61.9 % of febrile patients with infection, and 77.4% who didn't have an infection. A positive screening test in itself still requires further investigation in the causes of fever to confirm the diagnosis since the PPV is 65%. With the NPV of 48.9%, a negative screening test is still not reassuring that the febrile patient doesn't have an infection. Our study demonstrated the potential utilization of the elevated complement level as an inflammatory marker for infectious etiology of fever, as it has better LR+ when compares to ESR and CRP with similar turnaround time.

This study helps educate providers to acknowledge the fact that complement level does not have to be limited to be used on autoimmune related disorders only. Further large pool studies will be necessary to further investigate the role of complement levels as part of the screening test in a patient with fever.

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AB1248 MOLECULAR MARKERS OF PAIN AND OTHER SYMPTOMS IN KNEE OSTEOARTHRITIS

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Background: Osteoarthritis (OA) is one of the leading causes for disability in adults. The diagnosis of OA is generally based on patient reported pain, other symptoms and radiographic changes which occur in late stages. There have been extensive research over the last 30 years to identify and validate molecular markers for early diagnosis of OA and a large range of potential biomarkers has been identified[1, 2]. However, most of these biomarkers are markers of structural and metabolic changes, and have poor correlation with pain and stiffness in knee OA. The publicly available data from the National Institute of Health Osteoarthritis Initiative (OAI) provides an opportunity to search for clinically useful biomarkers associated with the main symptoms in OA.

Objectives: To identify molecular biomarkers which are associated with the main symptoms of knee OA.

Methods: 600 participants from 4791 men and women aged 45 to 79 who were Kellgren & Lawrence grade 1 or more were identified with biochemical markers data, radiographic and clinical features of OA. Nineteen biochemical markers measured in serum and/or urine were analysed for their association with primary clinical features of OA: Knee injury and Osteoarthritis Outcome Score (KOOS) pain and symptoms, and Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) pain and stiffness score. Patient level analysis