immunosuppressants. Participants were positive for antinuclear antibody or antidouble-stranded deoxyribonucleic acid and spoke fluent English.

Results The sample (female, n=13/15) was diverse by age (mean [standard deviation] age 52.1 [13.1] years), race and ethnicity, severity, and time since diagnosis. Results of the CE segment of the interview are displayed in the table. Eleven participants (73.3%) reported fatigue as their most bothersome symptom. Significant impacts of fatigue were described in relation to emotional (n=10), social (n=6), and physical (n=5) functions, as well as role difficulties (n=4) and struggles with activities of daily living (n=4). Qualitative analyses revealed that all FACIT Fatigue items map directly onto concepts spontaneously mentioned by participants during the interviews. All participants reported that the FACIT Fatigue items were easily understood, relevant, appropriate, and concise, and captured the most important concepts related to fatigue in SLE.

Conclusions The interviews demonstrated fatigue to be a central concern to patients with SLE and supported the content validity of the FACIT-Fatigue instrument as an appropriate and interpretable assessment of fatigue for this population. This study provides valuable insights into the experiences of patients with SLE and, specifically, the impact of fatigue on these patients.

51   BIRTHS TO WOMEN WITH SYSTEMIC LUPUS ERYTHEMATOSUS CAN BE IDENTIFIED ACCURATELY IN THE ELECTRONIC HEALTH RECORD

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Background Studying births to women with systemic lupus erythematosus (SLE) is difficult given its rarity and the challenges of prospective cohort studies. While the electronic

Abstract 51 Table 1

Algorithm	PPV training set[a]	PPV validation set[b]	Sensitivity training set	Sensitivity validation set	F-Score[c] training set	F-Score validation set
Any Clinician Coded						
ICD-9 code only						
≥1 count of the ICD-9 code	57%	66%	100%	88%	73%	75%
≥4 counts	77%	80%	87%	69%	82%	74%
ICD-10 codes only						
≥1 count of the ICD-10 code	77%	67%	95%	98%	85%	80%
≥4 counts	94%	73%	71%	83%	81%	78%
ICD-9 or ICD-10 code counts						
≥1 ICD-9 or ICD-10 code	56%	65%	100%	93%	72%	77%
≥4 ICD-9 or ICD-10 codes	81%	76%	95%	75%	87%	75%
ICD-9 or ICD-10 code counts AND antimalarials ever used						
≥1 ICD-9 or ICD-10 code	68%	72%	85%	41%	76%	52%
≥4 ICD-9 or ICD-10 codes	83%	77%	83%	38%	83%	51%
ICD-9 or ICD-10 code AND labs ever checked						
≥1 count	62%	72%	95%	86%	75%	78%
≥4 counts	84%	85%	93%	54%	**88%**	66%
ICD-9 or ICD-10 code AND ANA+[c]						
≥1 count	64%	70%	76%	63%	69%	66%
≥4 counts	79%	77%	76%	52%	77%	62%
Rheumatology Coded						
ICD-9 code only						
≥1 ICD-9 code	78%	86%	86%	73%	82%	79%
≥4 ICD-9 codes	88%	94%	70%	48%	78%	64%
ICD-10 codes only						
≥1 ICD-10 code	70%	82%	70%	83%	70%	**82%**
≥4 ICD-10 codes	88%	92%	45%	71%	60%	80%
ICD-9 or ICD-10 codes						
≥1 ICD-9 or 10 code	78%	85%	76%	80%	77%	**82%**
≥4 ICD-9 or 10 codes	85%	93%	71%	55%	77%	69%
ICD-9 code: 710.0. ICD-10 codes: M32.1,* M32.8, M32.9						

[a]The training set consisted of 100 subjects from the Vanderbilt EHR.
[b]The validation set consisted of 545 subjects from the Duke Autoimmunity in Pregnancy Registry and Duke EHR
[c]F-score: measure of performance of an algorithm, harmonic mean of PPV and sensitivity calculated as 2 x [(PPV x Sensitivity)/(PPV +Sensitivity)]
[d]ANA positive ≥1:160.

health record (EHR) is a powerful tool to capture coded diagnoses at a population level, accurately identifying SLE births is challenging. Our objective was to develop and externally validate algorithms for identifying births to SLE patients.

Methods We used two EHR-based datasets: Vanderbilts Synthetic Derivative and Dukes Clarity. Potential cases had at least 1 SLE code (ICD-9: 710.0 or ICD-10:M32.1*, M32.8, M32.9) and at least 1 ICD-9 or ICD-10 code for pregnancy-related diagnoses. At Vanderbilt, 100 potential cases were randomly selected for chart review and each classified as a case if SLE was diagnosed by a rheumatologist, nephrologist, or dermatologist. Using this dataset, positive predictive values (PPVs) and sensitivity were calculated for combinations of counts of SLE ICD-9 or ICD-10 codes provided by any clinician and by a rheumatologist (rheumatology coded), antimalarial use, positive ANA, and checked lupus labs (dsDNA, C3 or C4). F-score measured the performance of each algorithm. At Duke, potential cases were compared with the Duke Autoimmunity in Pregnancy Registry; cases outside of this registry underwent chart review. Vanderbilt served as a training set; Duke served as validation.

Results From Vanderbilts 2.8 million subject records, we identified 433 potential cases. Of the 100 cases randomly selected for chart review, 39 had confirmed SLE and a history of a birth. Of Dukes 659 potential cases, 545 were included in a validation set of which 208 had confirmed SLE. In the training set, algorithms with ICD-10 codes had higher PPVs than algorithms with ICD-9 codes (table 1). The algorithm with the highest F-score of 88% was 4 counts of ICD-9 or ICD-10 codes and checked lupus labs. Algorithms validated well in the Duke dataset. In the validation set, 1 ICD-9 or ICD-10 code (by a rheumatologist) performed best (F-score: 82%).

Conclusions We have developed and validated algorithms to detect SLE patients with births in the EHR. The highest performing algorithms use SLE ICD-9 or ICD-10 codes and clinical parameters or ICD-10 codes alone. Algorithms using more SLE coded visits have greater PPVs at a cost to sensitivity. While the PPV and sensitivity nears 90%, EHR cohorts remain complementary to prospective cohorts. However, in the era of big data, developing methods to identify SLE births accurately is critical to examine adverse outcomes such as preterm births.

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52   CONTACT DYNAMICS BETWEEN MESENCHYMAL STEM CELLS AND T CELLS IN LUPUS-PRONE MRL/LPR MOUSE MODEL

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Background Systemic lupus erythematosus (SLE) is a multi-organ autoimmune disease characterized by autoantibody production and mesenchymal stem cells (MSCs) have emerged as a promising new therapy for the treatment of SLE. MSCs are adult stem cells isolated from various human tissues including bone marrow, adipose tissue, umbilical cord blood, and skeletal muscle; MSCs can differentiate into various cell types and can potentially replace damaged cells *in vivo*. MSCs suppress T cell proliferation and cytokine production, reduce B cell proliferation and antibody secretion, decrease the generation and function of dendritic cells, and reduce the activity of natural killer cells. MSCs also enhance the activity of regulatory T (Treg) cells. MSCs are thought to inhibit T cell functions by two different mechanisms: by producing soluble mediators and by direct cellcell contacts. The soluble immunosuppressive factors produced by MSCs include IL-10, nitric oxide (NO), tumor growth factor (TGF)-, prostaglandin E2 (PGE2), and indoleamine 2,3-dioxygenase (IDO), all of which can inhibit the functions of major immune cells. Yet, much remains to be learned about the contact-dependent T cell inhibition by MSCs.

Methods We examined the *in vivo* efficacy of MSCs in lupus-prone MRL/lpr mouse model and examined how MSCs inhibit MRL/lpr T cells by using time-lapse imaging at the single level.

Results In this study, we show that transfer of human MSCs increased MRL/lpr mouse survival, decreased T cell infiltration in the kidneys, and reduced T cell cytokine expression. *In vitro*, allogeneic mouse MSCs inhibited MRL/lpr T cell proliferation and cytokine production. Time-lapse imaging revealed that MSCs recruited MRL/lpr T cells establishing long-lasting cellular contacts by enhancing T cell VCAM-1 expression in a CCL2-dependent manner. In contrast, CCL2 deficient MSCs did not induce T cell migration and VCAM-1 expression, resulting in insufficient cell-cell contact. Consequently, CCL2 deficient MSCs did not inhibit IFN- production by T cells and upon transfer no longer prolonged survival of MRL/lpr mice.

Conclusions Taken together, our imaging study demonstrates that CCL2 enables the prolonged MSC-T cell interactions needed for sufficient suppression of autoreactive T cells and helps to understand how MSCs ameliorate symptoms in lupus-prone MRL/lpr mice.

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53   HEALTH-RELATED QUALITY OF LIFE IN TUNISIAN PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOUS

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Background Systemic lupus erythematosus (SLE) is a chronic inflamatory disease witch can affect different aspects of the patients life, leading to an impairment of health-related quality of life (HRQOL).

The aim of our study was to investigate the role of demographic, clinical, immunological and psychological aspects in influencing the HRQOL of Tunisian patients with SLE and to compare the efficiency of both generic and specific questionnaires of QOL.