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Validation of a Large Rheumatoid Arthritis Cohort and Preventive Health Screening

Michael Grasso¹, **Dana Direnzo**², Yelena Yesha³, Naphtali Rishe⁴ and Amanda Niskar⁵, ¹Emergency Medicine, University of Maryland School of Medicine, Baltimore, MD, ²Internal Medicine, University of Maryland Medical Center, Baltimore, MD, ³Computer Science and Electrical Engineering, Professor, Baltimore, MD, ⁴Computer Science, Florida International University, Miami, FL, ⁵1330 West Peachtree Street NW, Arthritis Foundation, Atlanta, GA

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Session Title: Health Services Research
Poster I: Diagnosis, Management and Treatment Strategies

Session Time: 9:00AM-11:00AM

Background/Purpose:

We extracted a large cohort of rheumatoid arthritis (RA) patients, on which we plan to apply big data analytics for earlier diagnosis of RA. To help validate this cohort, we performed an initial study to answer a health services question regarding lipid surveillance and cardiovascular risk reduction in the RA community. Cardiovascular disease is the leading cause of death among people with RA. This disease risk is double to that of the general population. Our research was supported with resources from the Department of Veterans Affairs (VA).

Methods:

We worked with clinical data from the VA. This dataset is one of the largest clinical repositories available, and provides detailed patient information for approximately 35 million patients who have received care at more than 150 medical centers over the past 15 years. Using the VA repository of 35 million patients, we identified a cohort of roughly 155,000 patients with any RA ICD code (714.x). We used a previously published algorithm by JA Sing to define a RA cohort, by selecting patients with an ICD code 714.x and either a positive rheumatoid factor or a positive anti-CCP. This resulted in a cohort of 29,713 rheumatoid arthritis patients with an estimated specificity and positive predictive value of about 90%. The RA cohort contained 3,978 women (13%) and 19,826 Caucasians (67%), with an average age of 66, and with 19,761 (67%) on a disease-modifying antirheumatic drug.

Results:

A total of 6,632 patients (22%) had their LDL cholesterol checked at least once while receiving care

within the VA system. In addition, 421 (90%) of patients whose LDL was at least 190, 1,331 (85%) of patients whose LDL was at least 160, and 3,555 (72%) of patients whose LDL was at least 130 were placed on statin therapy.

Conclusion:

In this RA cohort, 22% had their LDL checked at least once during their follow-up in the VA. This suggests the need for improvements in lipid screening among rheumatoid arthritis patients in this population. However, this value is likely an underestimate, since it does not include patients who had their LDL checked outside the VA system. In addition, 78% of all people with RA and an LDL at least 130 were on statin therapy. We did not consider cardiovascular risk factors to determine the appropriate pharmaceutical management strategy. In addition, we did not consider reasons why patients may not have been on a statin.

Our research incorporated a large and comprehensive data set, whose size and attributes create analytic and data mining issues that are beyond the capabilities of traditional software tools. We are currently working on machine learning tools for big data analytics, which we hope to use for early disease prediction of RA.

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