

Impact of Comorbid Conditions on Healthcare Expenditure and Work-related Outcomes in Patients with Rheumatoid Arthritis

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Slide 1: Title slide

On behalf of the co-authors today, I am pleased to be taking you through an overview of our recent publication titled, “Impact of comorbid conditions on healthcare expenditure and work-related outcomes in patients with rheumatoid arthritis.”

Slide 2: Comorbidity burden in patients with rheumatoid arthritis

Rheumatoid arthritis is a chronic autoimmune disorder of the joints causing joint inflammation and severe pain for patients.

Comorbidities remain as a serious health problem for many rheumatoid arthritis patients, and on average, rheumatoid arthritis patients have two or more comorbid conditions.

The COMOrbidities in Rheumatoid Arthritis study, otherwise known as the COMORA study, evaluated the presence of comorbidities in rheumatoid arthritis patients across 17 countries and demonstrated that many comorbid conditions were highly prevalent in RA patients such as hypertension, depression, asthma, and cardiovascular diseases.

These comorbidities have an economic impact on patients with rheumatoid arthritis. Previous research showed that rheumatoid arthritis patients with cardiovascular diseases and/or depression incurred significantly higher direct healthcare costs arising from increased utilization of health services compared to patients with rheumatoid arthritis alone.

By the time we conducted our study, the literature on the impact of comorbidities on healthcare expenditure was limited to a few comorbid conditions. Furthermore, there was limited research into the consequences of comorbidities on work-related outcomes such as employment status, absenteeism, and income.

Therefore, we aimed to evaluate the effect of comorbid conditions on direct healthcare expenditure and work-related outcomes in patients with rheumatoid arthritis.

Slide 3: Methods

Our study population was adult patients with rheumatoid arthritis aged 18 years and older living in the United States irrespective of treatment received.

Our study used the publicly available Medical Expenditure Panel Survey data, known as the MEPS data, to evaluate the direct and indirect costs of comorbidities in a nationally representative, non-institutionalized US population with rheumatoid arthritis. We pooled MEPS data across 10 calendar years starting from 2006 up until 2015 to increase the power of statistical significance.

We were interested in four economic outcomes for direct and indirect costs. This included average annual healthcare expenditure, employment status, absenteeism defined as days of sick leave, annual income.

We developed four separate multivariable regression models for each of the economic outcomes. Each model was adjusted for comorbid conditions and sociodemographic factors as listed here.

The list of comorbid conditions was selected based on prior literature and their prevalence in the MEPS dataset such that only comorbid conditions with a prevalence of greater than 1% were included.

Slide 4: Methods — statistical analysis

In terms of the statistical analysis, we used the generalized linear model with a log-link and gamma distribution to assess the association of average annual healthcare expenditure and annual income between comorbidities among patients with rheumatoid arthritis.

For employment status, we used a logistic linear regression model, and for the absenteeism model, we used a zero-inflated negative binomial regression model. Both the employment status and absenteeism model were restricted to working aged rheumatoid arthritis adults.

Variables were selected in each model based on univariable association.

Further additional information on statistical modelling using the MEPS dataset is provided in supplementary materials.

Slide 5: Patient characteristics

There were 4,967 adult patients with rheumatoid arthritis from 2006 to 2015 in the MEPS dataset. Most patients were women, had an average age of approximately 60

years, resided in the Southern states of the US, were unmarried, White, had a family income level categorized as poor or negative, had public insurance coverage only, completed high school as highest level of education attainment, and were non-smokers.

Slide 6: Patient characteristics

The most prevalent chronic comorbid conditions in our sample were hypertension, followed by lipid metabolism disorders, diabetes, and depression. The least common comorbid conditions were stroke, heart failure and peptic ulcer. Patients with rheumatoid arthritis with no comorbid conditions accounted for 14.6% of the rheumatoid arthritis population.

Slide 7: Average annual healthcare expenditure

Several comorbid conditions resulted in higher average annual healthcare expenditure compared to patients without the condition, which included hypertension, diabetes, depression, eye and adnexa disorders, chronic obstructive pulmonary diseases, cancer, myocardial infarction, osteoporosis, stroke, and heart failure.

Heart failure was one of the least prevalent comorbid conditions in the dataset, but rheumatoid arthritis patients with heart failure incurred an additional \$8,205 US dollars in 2015 currency in direct health costs compared to rheumatoid arthritis patients without heart failure.

Slide 8: Employment status

Our results showed that among working aged rheumatoid arthritis patients with either hypertension, depression, chronic obstructive pulmonary disease, cancer, osteoporosis, stroke, and heart failure were, statistically speaking, less likely to be employed compared to rheumatoid arthritis patients without the condition.

Slide 9: Absenteeism (days of sick leave)

In employed working aged rheumatoid arthritis patients, hypertension, depression, eye and adnexa disorders and stroke had a statistically significant effect on absenteeism. The risk of absenteeism was highest for stroke; rheumatoid arthritis patients with stroke were more likely to miss days of work due to ill health compared to rheumatoid arthritis patients without stroke.

Slide 10: Annual income

Finally, in terms of annual income, rheumatoid arthritis patients with either diabetes, chronic obstructive pulmonary diseases or heart failure had a lower annual income compared to rheumatoid arthritis patients without the condition.

The mean decrease in income per rheumatoid arthritis patient per year was \$15,833 US dollars in 2015 currency for heart failure.

Slide 11: Conclusions

In conclusion, our study demonstrated about a dozen comorbidities significantly contributed to direct and indirect costs associated with rheumatoid arthritis.

Out of all the comorbid conditions assessed, heart failure was associated with the highest incremental expenditure, the lowest likelihood of being employed and the highest incremental lost income compared to other common comorbid conditions in rheumatoid arthritis.

The economic impact of comorbidities in rheumatoid arthritis is substantial, which therefore necessitates efforts to ensure appropriate prevention and management strategies for comorbidities are in place for patients with rheumatoid arthritis, and avoid downstream costs and financial hardships for patients.

Thank you for your time and attention.