

**Prevalence of alcohol consumption among Rheumatoid Arthritis patients on Methotrexate and impact on liver function tests**

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# Introduction

- In the last decade methotrexate (MTX) has become the most commonly prescribed disease modifying anti-rheumatic drug for the treatment of rheumatoid arthritis (RA).
- The prevalence of alcohol consumption among RA patients, especially those taking Methotrexate (MTX) is unknown.
- American College of Rheumatology (ACR) recommends that patients on MTX limit their alcohol intake to 2 drinks or less per month because it may increase the risk of liver damage.

# AIM

- To study the prevalence and quantity of alcohol use in RA patients on MTX
- Evaluate if alcohol consumption results in elevated liver function tests (LFTs), mainly aspartate transaminase (AST) and alanine transaminase (ALT).

# Methods

- Eligible subjects: RA patients enrolled in a prospective observational cohort (BRASS)
- Medication use collected annually from physician report
- Alcohol consumption data collected during annual patient interview:
  - Please indicate your average use, DURING THE PAST YEAR, of regular beer, light beer, red wine, white wine, and liquor (Never, 1/day, 2-3/day, 4-5/day, 6+/day, 1/week, 2-4/week, 5-6/week, 1-3/month)
- LFTs from electronic medical record during the time period of the MTX use:
  - Abnormal AST level >30 U/L
  - Abnormal ALT level >52 U/L

# Methods

- Statistical Analysis
  - General linear model compared patients who reported drinking >2 drinks/month while on MTX (MTX alcohol users) versus patients did not drink (MTX alcohol non-users).
  - Mixed model used to compare LFTs of MTX alcohol users versus MTX alcohol non-users evaluating multiple time points for the cohort adjusting for age and gender
  - BMI and diabetes added to the mixed model to see if these co-morbidities had a greater impact on LFTs among the alcohol users

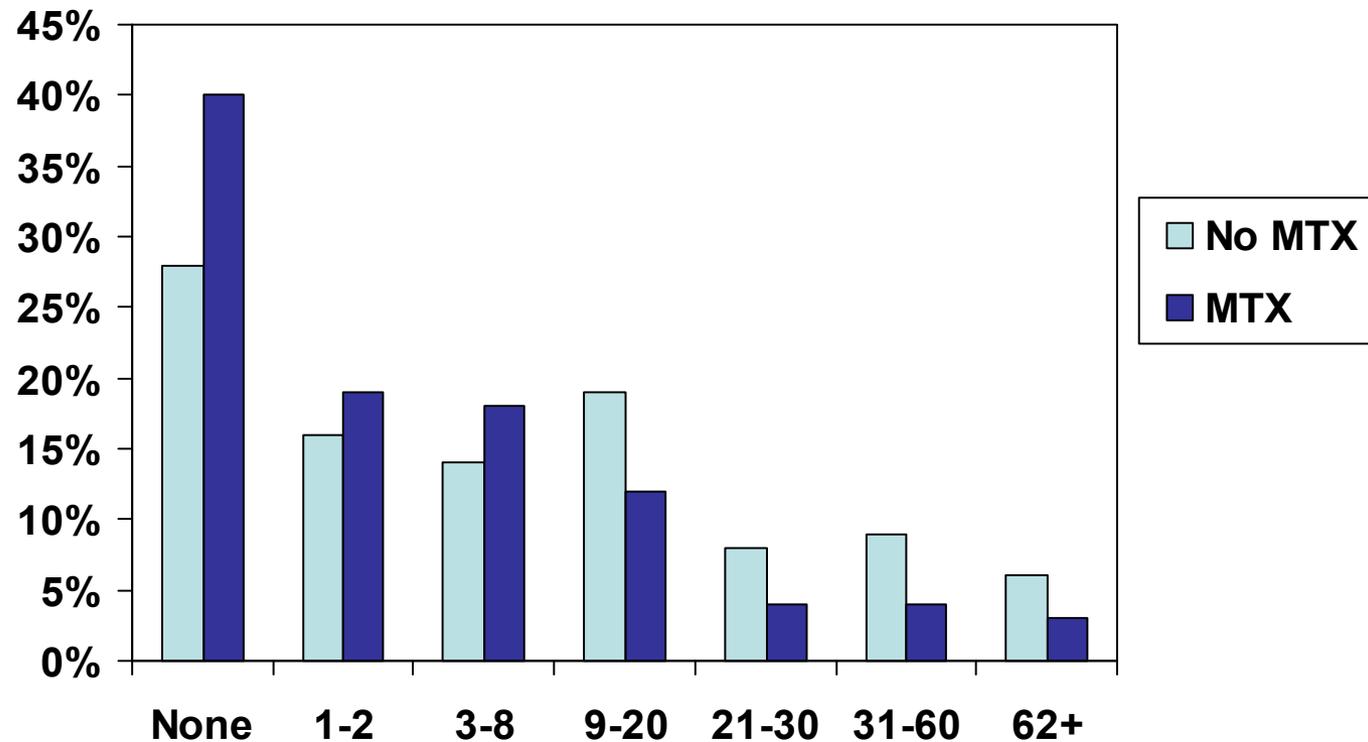
# Results

- Our analyses included a total of 738 patients
- 563 patients were on MTX treatment
- 6% of patients on MTX treatment had a diagnosis of diabetes
- 23% of patients on MTX treatment were obese (BMI >30)

# Results

**Figure 1. Alcohol Consumption by MTX vs. no MTX treatment**

**Percent of patients by total drinks per month**



**Table 1. Characteristics of MTX alcohol users vs. MTX alcohol non-users**

	<b>Alcohol Users (±SE)</b>	<b>Alcohol Non-Users (±SE)</b>	<b>P-Value<sup>a</sup></b>
<b>BMI</b>	<b>26.4 ± 0.35</b>	<b>27.7 ± 0.35</b>	<b>0.0015</b>
<b>Disease Duration</b>	<b>11.4 ± 0.73</b>	<b>14.0 ± 0.73</b>	<b>0.0037</b>
<b>Physical Function (0-100) (MDHAQ)</b>	<b>27.8 ± 1.63</b>	<b>36.1 ± 1.73</b>	<b>&lt;0.0001</b>
<b>Pain Scale (0-100) (MDHAQ)</b>	<b>30.1 ± 1.8</b>	<b>38.0 ± 1.92</b>	<b>0.0004</b>
<b>Physician Global Scale (0-100)</b>	<b>31.5 ± 1.39</b>	<b>34.3 ± 1.39</b>	<b>0.09</b>

<sup>a</sup> General linear model for characteristics of MTX treated patients among alcohol users and alcohol non-users, adjusted for age and gender

**Table 2. Comparison of ever having an abnormal LFT result among MTX treatment vs. no MTX by alcohol use vs. non-use**

	<b>Alcohol Users</b>	<b>Alcohol Non-Users</b>
<b>MTX Treatment</b>	<b>107 (34.1%) (N=314)</b>	<b>85 (34.1%) (N=249)</b>
<b>No MTX</b>	<b>60 (51.7%) (N=116)</b>	<b>18 (30.5%) (N=59)</b>

## Table 3. Impact of Alcohol Consumption on LFT Levels

<b>Liver Function Tests of MTX alcohol users vs. non-users</b>						
	<b>AST</b>			<b>ALT</b>		
	<b><math>\beta</math></b>	<b>SE</b>	<b>P-Value</b>	<b><math>\beta</math></b>	<b>SE</b>	<b>P-Value</b>
<b>Adjusted age &amp; gender<sup>a</sup></b>	<b>0.0</b>	<b><math>\pm 0.01</math></b>	<b>p=0.5</b>	<b>0.0</b>	<b><math>\pm 0.01</math></b>	<b>p=0.4</b>
<b>Full Model (BMI &amp; Diabetes)<sup>b</sup></b>	<b>0.0</b>	<b><math>\pm 0.3</math></b>	<b>p=0.5</b>	<b>0.0</b>	<b><math>\pm 0.3</math></b>	<b>p=0.9</b>

<sup>a</sup>Mixed model for alcohol use predicting elevated LFTs among patients on MTX treatment, adjusted for age and gender; <sup>b</sup> Model additionally adjusted for body mass index and diabetes

# Conclusions

- Despite warnings of the dangers of drinking alcohol while taking MTX, 38% of patients continue to drink more than recommended
- We could find no evidence that MTX alcohol users had higher LFTs overall when compared with MTX alcohol non-users.
- MTX alcohol users tended to report less pain and better physical function, however, further study is necessary to determine the clinical impact of this level of alcohol use among MTX treatment.

# Limitations

- Alcohol consumption is tabulated via self-report
- Could not analyze patients with cirrhosis or serious liver disease due to limited numbers
- The mixed model analysis did not have a comparison group of patients not on MTX treatment
- Patients taking MTX are more likely to have their LFTs tested than patients not taking MTX