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Comparison of Rheumatoid Arthritis Treatment Patterns Pre-, During, and Post-COVID-19 Quarantine in the United States: National Data from the TriNetX Network

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BACKGROUND

- Rheumatoid arthritis (RA) is an autoimmune disease-causing inflammation of the joints, which leads to swelling and pain. If left untreated, cartilage damage and irreversible joint deformity can occur.
- RA is estimated to affect 0.5-1% of the population globally (~0.6% of the United States (US) population)[1].
- There is no cure for RA and treatment focuses on pain management.
- First line treatment aims to control swelling, slow progression, and prevent joint deformity[2].

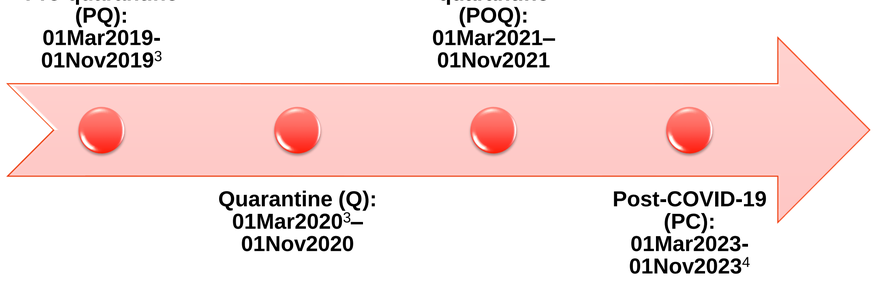
OBJECTIVE

- Information on the impact of the COVID-19 pandemic on RA treatment patterns is limited.
- This study aimed to compare RA treatment patterns before, during, and after COVID-19 in patients located in the US utilizing the TriNetX network.

METHODS

- US RA patients were queried from TriNetX and separated into four time-period groups: Pre-quarantine (PQ), Quarantine (Q), Post-quarantine (POQ), and Post-COVID-19 (PC) (**Figure 1**).

Figure 1. Time-Period Groups



[3]The first recorded case of COVID-19 is estimated Dec2019. ~1 month prior chosen as the PQ end date/month. 01March2020 the WHO declared COVID-19 as a pandemic. Beginning of the month chosen as Q start date/month.
[4]09May2023 US President Joe Biden ended the public health emergency. 2023 established as the last year cohort.
Note: All time periods kept the same (01Mar – 01Nov) to capture as many cases within the same months as possible.

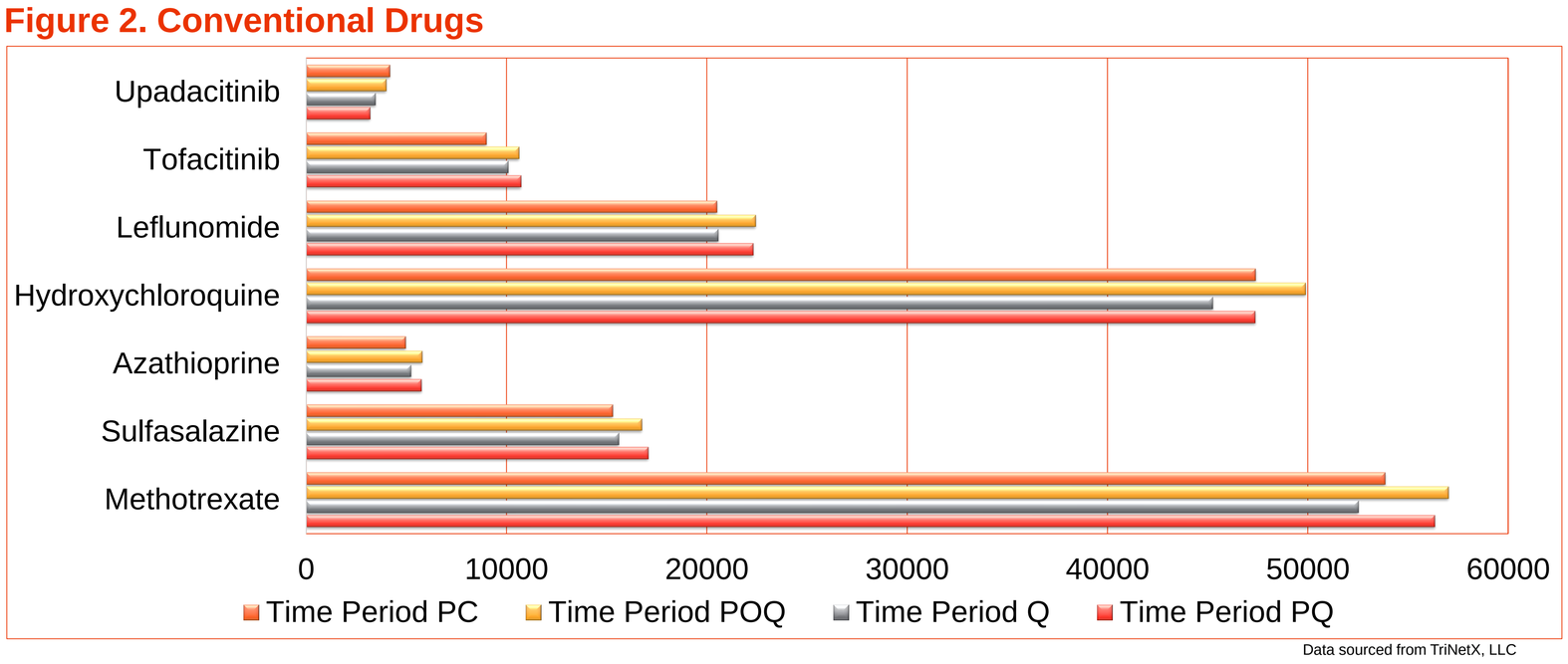
- Eligible patients with ICD-10 diagnosis code M06.9 RA (with or without the rheumatoid factor) were identified (on 19Jun2024) and analyzed by time-period.
- The most common conventional and biologic treatments were searched and analyzed. Treatments were separated based on the mode of administration (i.e., oral conventional drugs vs. subcutaneous biologics) (**Table 1**). Medications with <1000 patient count were removed for analysis purposes.

Table 1. Conventional and Biologic Drugs

Drug Type	Drug Name	
Conventional	Methotrexate	
	Sulfasalazine	
	Azathioprine	
	Hydroxychloroquine	
	Leflunomide	
	Tofacitinib	JAK Inhibitors
	Upadacitinib	
	Baricitinib*	
	Filgotinib*	
Biologics	Adalimumab	TNF inhibitors
	Etanercept	
	Infliximab	
	Certolizumab pegol	
	Golimumab	
	Afelimomab**	
	Opinercept**	
	Rituximab	
	Tocilizumab	
	Abatacept	

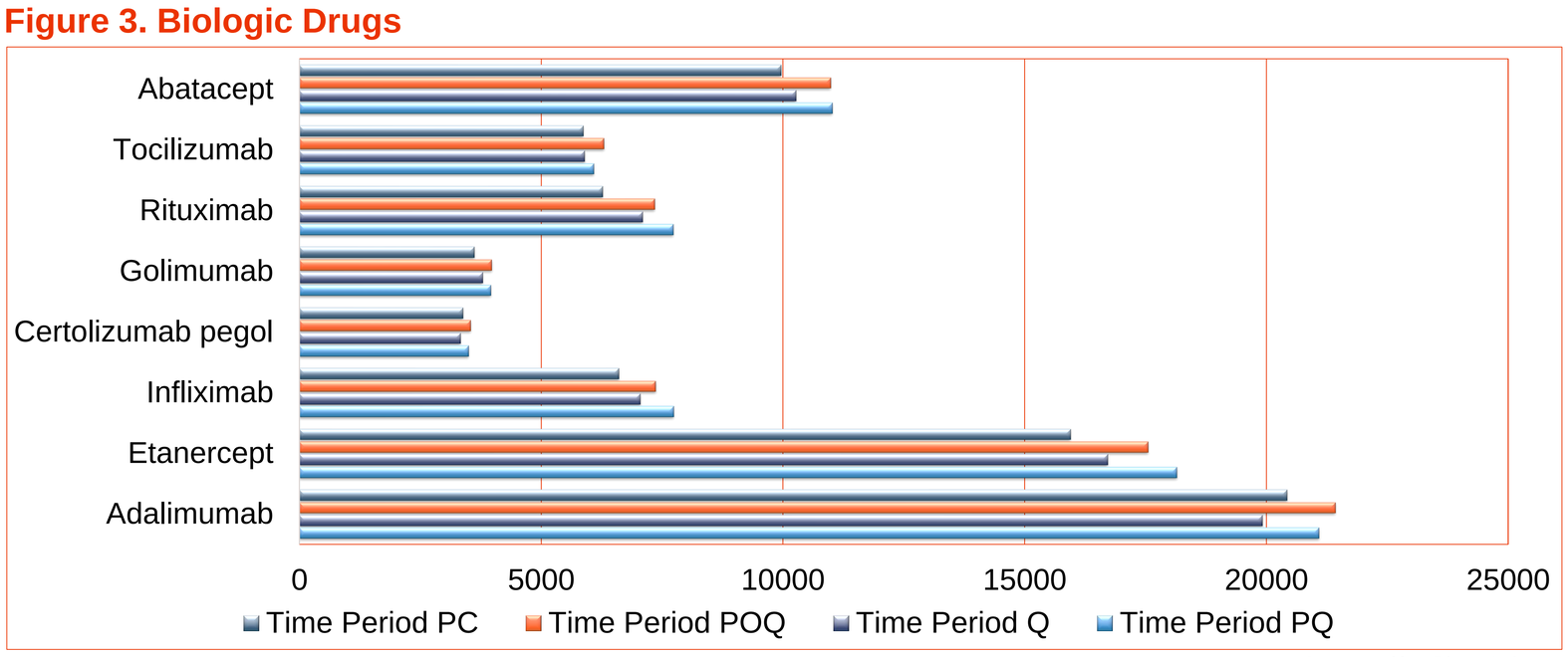
Abbreviations: JAK= janus kinase; TNF = tumor necrosis factor.
*Drugs were analysed but removed from final analysis due to <1000 patient counts.
**Counts were not found in TriNetX.
Data sourced from TriNetX, LLC.

Figure 2. Conventional Drugs



Data sourced from TriNetX, LLC

Figure 3. Biologic Drugs



Data sourced from TriNetX, LLC

RESULTS

- We identified 154,160 (PQ), 143,440 (Q), 157,900 (POQ), and 156,360 (PC) patients with RA (**Table 2**).
- The mean age of RA patients ranged from 64-67 years and the majority were female (72-73%) (**Table 2**).
- Use of conventional (n=7) and biologic (n=8) RA drugs was hardly affected by the COVID-19 pandemic (**Figures 2 and 3**).
- Methotrexate and hydroxychloroquine were the two most used ***conventional drugs*** (**Figure 2**).
  - Methotrexate use was 37% during PQ and Q, 36% during POQ, and 34% during PC.
  - Hydroxychloroquine use was 31% during PQ, 32% during Q and POQ, and 30% during PC.
- Adalimumab and etanercept were the two most used ***biologic drugs*** (**Figure 3**)
  - Adalimumab use was 14% during PQ, Q, and POQ, and 13% during PC
  - Etanercept use was 12% during PQ and Q, 11% during POQ, and 10% during PC.

Table 2. Patient Demographics

Time Period	Patient Count (n)	Mean Age (Years)	Sex (F)	Race	Ethnicity
PQ	154,160	67.2	73%	White (68%)	Not Hispanic or Latino (71%)
Q	143,440	65.7	73%	White (69%)	Not Hispanic or Latino (73%)
POQ	157,900	65.5	73%	White (68%)	Not Hispanic or Latino (74%)
PC	156,360	64.3	72%	White (68%)	Not Hispanic or Latino (74%)

Time Periods: PQ= 01Mar2019–01Nov2019; Q=01Mar2020–01Nov2020; POQ=01Mar2021–01Nov2021; PC=01Mar2023–01Nov2023.
Data sourced from TriNetX, LLC

CONCLUSIONS

- The use of conventional and biologic drugs for RA was hardly affected by the COVID-19 pandemic as assessed in a US secondary data source.
- In a future study we plan to further investigate the identified reduction in available patients during the US COVID-19 quarantine period (March – November 2020).

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