Modification of immunomodulatory medications by rheumatology patients during the peak of the COVID-19 pandemic in New York City

Medha Barbhaiya1,2,3 · Marianna B. Frey4 · Jonah Levine4 · Gregory Vitone4 · Lindsay Lally1,2 · Michael D. Lockshin1,2 · Vivian Bykerk1,2 · Candace H. Feldman5 · Lisa A. Mandl1,2,3

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Dear Editor,

Within the USA, from March through May 2020, New York City was an early coronavirus disease 2019 (COVID-19) “hot spot.” Due to concerns about the increased risk of severe illness due to immune dysfunction and the use of immunomodulatory or immunosuppressive medications [1, 2], patients with systemic rheumatic diseases living in New York City may have modified their immunomodulatory and immunosuppressive medications to mitigate the risk of severe infection. Our study evaluates medication modification during the early stage of the pandemic in the USA by patients followed at a major rheumatology center in New York City.

We emailed a secure web-based survey to 26,045 patients ≥18 years evaluated at least once by a rheumatologist between April 1, 2018, and April 21, 2020, at our hospital in New York City. Patients completed the survey by email or phone between April 24, 2020, and May 26, 2020. We collected information on potential SARS-CoV-2 exposure, symptoms, and rheumatic disease history. Patients reported any immunomodulatory or immunosuppressive medication use in the previous 6 months and indicated whether they increased, decreased, or discontinued their medication after February 1, 2020 (i.e., during the COVID-19 pandemic), as well as reasons for medication changes. This study was approved by the Hospital for Special Surgery Institutional Review Board.

A total of 6357/26,045 respondents (24.4%) answered the medication questions. The mean age of respondents was 59.3 (standard deviation [SD] 15.9) years; 77.6% were female, 82.9% were White, 4.5% were Black, and 7.1% were Hispanic/Latinx. A total of 3111 respondents (48.9%) reported any use of at least one immunomodulatory or immunosuppressive medication in the previous 6 months: 1996 respondents used 1 immunosuppressive or immunomodulatory medication, 828 used 2 medications, and 287 used ≥2 medications.

Therefore, as some patients reported the use of more than one medication, among the 3111 patients, there were 4585 individual reports of any immunomodulatory/immunosuppressive medication use.
immunosuppressive medication use: 1170 (25.5%) antimalarials, 1008 (22.0%) biologics, 1216 (26.5%) conventional disease-modifying antirheumatic drugs (DMARDs), 986 (21.5%) corticosteroids, 148 (3.2%) small molecules, and 57 (1.2%) other DMARDs (Table 1). One-fourth of medications (1157/4585) were modified; of these, 152 were increased (13.1%), 469 were decreased (40.5%), and 536 were discontinued (46.3%) (Table 1). For each respondent, we collected only one modification per medication. Among dose reductions, 33.5% were for corticosteroids, 31.6% for biologics, 18.6% for conventional DMARDs, 13.9% for antimalarials, and 2.1% for small molecules. Medication discontinuation was highest for corticosteroids (50.7%), followed by conventional DMARDs (20.0%), biologics (15.9%), antimalarials (9.5%), and small molecules (2.8%). Tumor necrosis factor inhibitors (TNF inhibitors) accounted for most biologic dose reductions (64.2%) and discontinuations (50.6%). Methotrexate accounted for the majority of conventional DMARD dose reductions (67.8%), but less than half (47.7%) of total discontinuations. 42.8% increases in medication doses were for corticosteroids and 24.3% for conventional DMARDs. Medication reductions were advised >50% of the time by a physician across medication categories, often but not always by a rheumatologist (Supplement). Up to 41% of discontinuations in any medication category were patient-directed (Supplement).

During the initial peak of the COVID-19 pandemic in New York City, patients at our large, specialty center modified one-fourth of immunomodulatory/immunosuppressive medications. Across medication categories, over half of medication reductions/discontinuations were recommended by a physician, while up to 41% of discontinuations were patient-directed. This is a description of patient behaviors; we did not perform statistical analyses to avoid biases due to our large numbers and multiple comparisons. Our response rate is acceptable for large surveys [3].

Our findings provide insight into the real-world behavior related to medication use by patients with rheumatic disease, before the first American College of Rheumatology COVID-19 task force guidelines were widely disseminated.

| Immunomodulatory medication dosage modification among rheumatology patients who reported use in the last 6 months during the April to May 2020 COVID-19 pandemic “surge” in New York City |
|---------------------------------|----------------|----------------|----------------|----------------|----------------|
| Medication usage (N reports)    | Overall use    | Increased dosage | Decreased dosage | Medication discontinued* | No change |
| Antimalarials                   | 4585           | 152             | 469             | 536             | 3428          |
| Biologics                       | 1170 (25.5)    | 30 (19.7)       | 65 (13.9)       | 51 (9.5)        | 1024 (29.9)   |
|      Abatacept                   | 1008 (22)      | 17 (11.2)       | 148 (31.6)      | 85 (15.9)       | 758 (22.1)    |
|      Belimumab                   | 61 (6.1)       | 0 (0)           | 6 (4.1)         | 9 (10.6)        | 46 (6.1)      |
|      TNF inhibitors              | 47 (4.7)       | 1 (5.9)         | 7 (4.7)         | 2 (2.4)         | 37 (4.9)      |
|      IL-6 inhibitors             | 596 (59.1)     | 9 (52.9)        | 95 (64.2)       | 43 (50.6)       | 449 (59.2)    |
|      IL-1 inhibitors             | 77 (7.6)       | 2 (11.8)        | 8 (5.4)         | 10 (11.8)       | 57 (7.5)      |
|      IL-12/23 inhibitors         | 10 (1)         | 0 (0)           | 2 (1.4)         | 2 (2.4)         | 6 (0.8)       |
|      IL-17 inhibitors            | 17 (1.7)       | 0 (0)           | 1 (0.7)         | 2 (2.4)         | 14 (1.8)      |
|      Cyclophosphamide            | 92 (9.1)       | 3 (17.6)        | 14 (9.5)        | 9 (10.6)        | 66 (8.7)      |
|      Rituximab                   | 6 (0.6)        | 0 (0)           | 0 (0)           | 3 (3.5)         | 3 (0.4)       |
| Conventional DMARDs             | 102 (10.1)     | 2 (11.8)        | 15 (10.1)       | 5 (5.9)         | 80 (10.6)     |
|      Methotrexate                | 596 (57.2)     | 25 (67.6)       | 59 (67.8)       | 51 (47.7)       | 561 (57)      |
|      Mycophenolate               | 182 (15)       | 3 (8.1)         | 12 (13.8)       | 29 (27.1)       | 138 (14)      |
|      Azathioprine                | 73 (6)         | 2 (5.4)         | 5 (5.7)         | 5 (4.7)         | 61 (6.2)      |
|      Sulfasalazine               | 163 (13.4)     | 4 (10.8)        | 8 (9.2)         | 13 (12.1)       | 138 (14)      |
| Corticosteroids (methylprednisolone, prednisone) | 986 (21.5) | 65 (42.8) | 157 (33.5) | 272 (50.7) | 492 (14.4) |

Column percentages are shown for all numbers

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Table 1

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Understanding patient and physician behavior during this public health crisis will help guide planning for any COVID-19 surges due to new variants or future pandemics. This work also lays the foundation for longitudinal studies that evaluate the impact of unanticipated medication changes on rheumatic disease flares and outcomes.

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Methodology: MB, LAM, VB, and CHF
Formal analysis and investigation: MB, LAM, GV, MBF, and JML
Writing—original draft preparation: MB and LAM
Writing—review and editing: MB, MBF, JL, GV, LL, MDL, VB, CHF, and LAM
Supervision: MB, LL, MDL, VB, CHF, and LAM

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Declarations

Disclosures None.

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