Using Social Media Conversations to Understand Patient Care: Factors Driving Proactive vs Reactive Management of Gout

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BACKGROUND

Gout is a chronic disease of monosodium urate deposition marked by hyperuricemia, painful arthritis flare-ups, and tophi.[1]

Gout management can be construed as 2 distinct approaches: *proactive* (e.g., regular doctor visits, treating the underlying illness) and *reactive* (e.g., urgent care/walk-in clinic visits). Despite numerous guidelines, the optimal management strategy for gout is debated.

We assessed patient views on each approach to improve our understanding of these management methods. We sought to identify gout symptoms associated with proactive and reactive management. Further, we wanted to contrast the sentiments of online gout community conversations when describing proactive vs reactive therapeutic experiences.

METHODS

We evaluated 2 online social media communities using a proprietary artificial intelligence (AI) engine that evaluates social media conversations. We leveraged the engine's ability to:

1. Parse conversations by care type
2. Extract clinical findings
3. Quantify the general sentiment of conversations

Finding a doctor who knows gout is essential to get ahead of symptoms. The best way to deal with gout pain is to not let it start.

-Gout community member

RESULTS

FIGURE 1. SOURCE DATA

Gout Support Group of America	r/gout
50,000 POSTS & COMMENTS	125,000 POSTS & COMMENTS
2021-2022 DATE RANGE	2011-2022 DATE RANGE

Conversations from 2 social media sources were evaluated in this study: a private Facebook group (Gout Support Group of America, 15,000+ members) and a public subreddit (r/gout, 9,000+ members).

FIGURE 2. PROACTIVE VS REACTIVE CARE STATEMENTS

Our engine first tagged posts/comments related to each care type by filtering for terms associated with each (e.g., for proactive: 'primary care', 'pcp'; for reactive: 'urgent care', 'walk-in clinic'). Proactive care statements included 1,205 posts/comments, and reactive care included 1,253 posts/comments used for further analysis.

Next, the engine identified the top 10 clinical findings by care type (Fig. 2). In both groups, 'flare', 'pain', 'uric acid', and 'swelling' were the top 4 findings mentioned and were deemed outliers (based on IQR * 1.5) relative to all other clinical findings per group.

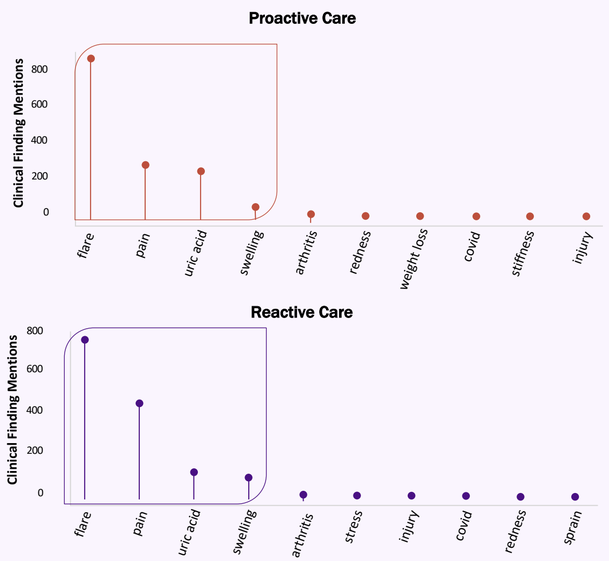
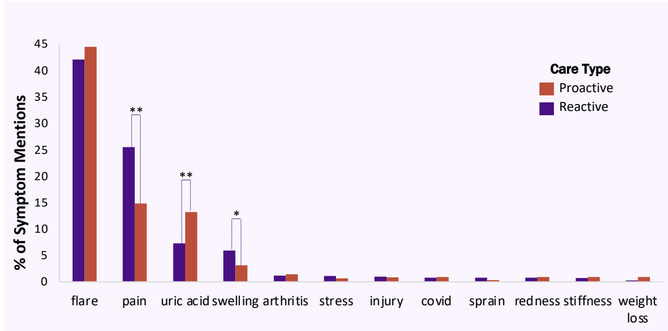


FIGURE 3. COMPARING SYMPTOM DISCUSSIONS BY CARE TYPE

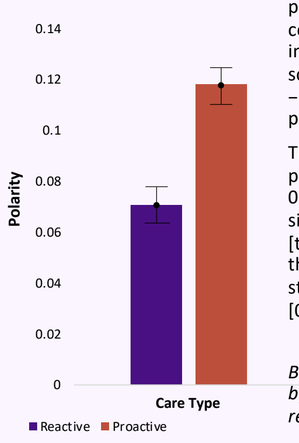


* Indicates $P < .01$, ** indicates $P < .001$

We fit a logistic regression model in which symptom mention predicted care type (proactive vs reactive).

Mentions of 'pain' and 'swelling' increased the probability that the care type discussed was reactive, whereas 'uric acid' mentions were associated with a higher probability of discussing proactive management.

FIGURE 4. CONTRASTING SENTIMENT: PROACTIVE VS REACTIVE CARE



We compared the overall polarity (a measure of how positive or negative a post/comment is) of conversations in each care type. Our engine scored each statement from −1 (most negative) to 1 (most positive).

The results indicated that proactive care (mean [SD], 0.12 [0.15]) statements were significantly more positive [$t(2456) = 4.31$, $P < .001$] than were reactive care statements (mean [SD], 0.07 [0.19]).

Bars represent mean polarity by care type. Error bars represent SEM.

CONCLUSIONS

Two online gout communities were analyzed to contrast proactive and reactive gout care/management. These findings suggest that 'flares', 'pain', 'swelling', and experiences related to 'uric acid' are primary motivators for individuals seeking gout care. One possibility is that pain and swelling from gout flares drive individuals to reactive care, whereas discussions on uric acid occur proactively in outpatient primary care offices. This study also revealed that reactive care conversations tended to be more negative, supporting the position that proactive management may be more beneficial for individuals with gout overall.

DISCLOSURES

The study was funded by Horizon Therapeutics plc. B. LaMoreaux, K. Davidson are employees of and hold stock in Horizon. C. Parker is a speaker for Horizon. M. Flurie, M. Converse, C. DeFelice, M. Picone, E. Wassman are employees of and hold stock in TREND Community. TREND Community's clients are pharmaceutical and biotechnology companies including but not limited to Horizon Therapeutics plc.

FUTURE DIRECTION

Future work should continue investigating these patient-reported perspectives and experiences. Ultimately, these insights could support clinicians, caregivers, and patients in better understanding and guiding proactive care-based management decisions.

Abstract

USING SOCIAL MEDIA CONVERSATIONS TO UNDERSTAND PATIENT CARE: FACTORS DRIVING PROACTIVE VS REACTIVE MANAGEMENT OF GOUT

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Background: To understand the needs of a particular community, it is imperative to actively listen to and interpret the patient experience. We used a proprietary artificial intelligence (AI) analytics engine that uses natural language processing to evaluate social media conversations in online gout communities. Gout is a chronic disease defined by uric acid crystal deposits which induce painful arthritis flares/flare-ups[1]. Managing gout can be characterized by two approaches: proactive and reactive management. Proactive management refers to scheduled, prophylactic care (e.g., regular doctor visits, treating underlying illness), whereas reactive management is spontaneous care driven by symptom onset (e.g., urgent care/walk-in clinic visits). The ideal management strategy is debated. Subspecialty groups recommend a proactive "treat-to-target" strategy focused on uric acid. The American College of Physicians recommends "treat-to-symptom control" without a "treat-to-uric acid-target" strategy. We assessed patient views on each to improve our understanding of these management methods.

Objectives: The current study aimed to identify gout symptoms associated with reactive management. We also wanted to contrast the sentiment of online gout community conversations when describing proactive vs reactive therapeutic experiences.

Methods: We evaluated 2 social media sources: a private Facebook group, The Gout Support Group of America (1000+ members, 99 countries), which had 50,000 posts/comments gathered in 2021-2022; and a public subreddit (r/gout) (9000+ members) with 125,000 posts/comments from 2011-2022. Our AI engine first tagged all posts/comments discussing proactive or reactive care experiences. Entity recognition was then used to identify the most frequently mentioned clinical findings in conversations by care type. We then fit a logistic regression model in which clinical finding mentions predicted care type. To characterize the general sentiment of conversations, the engine scored all posts/comments from −1 (most negative) to 1 (most positive) using a pretrained sentiment tagger.

Results: Flares, pain, uric acid, and swelling were the most frequently mentioned in both proactive and reactive conversations. Reactive care gout conversations (n = 1253 posts/comments from 624 users) were associated with a significantly higher probability of mentioning 'pain' and 'swelling' and a significantly lower probability of mentioning 'uric acid' than

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were proactive care conversations (n = 1205 posts/comments, 521 users). Mentioning 'flares' did not significantly impact the probability of mentioning either care type. Sentiment analysis showed that reactive care statements had a significantly lower mean sentiment score; indicating discussions about reactive care experiences tended to be more negative than those about proactive care.

Conclusions: In analyzing gout social media posts, we found that flares, pain, swelling, and concerns related to uric acid were primary motivators for individuals seeking gout care. Conversations mentioning 'pain' were twice as likely to mention reactive care compared to proactive gout conversations. Analysis also showed that reactive care gout conversations tended to be more negative, supporting the position that proactive management may be more beneficial for individuals with gout overall. This type of information can be used to identify and address patients' areas of concern or dissatisfaction. Future work should continue exploring these patient-reported perspectives and experiences so clinicians, caregivers, and patients can better understand and guide care-based management decisions.

Funding Acknowledgements

The authors would like to thank TREND Community managers Matthew Horsnell and Rachelle Cook for their contribution in providing advocacy and support for the gout community; and the private Facebook group, Gout Support Group of America, for providing access to data during the preparation of this study.

Funding for this work was provided by Horizon therapeutics, plc.

References

1. Mikuls TR. Gout. *N Engl J Med*. 2022;387(20):1877-1887. doi:10.1056/NEJMcp2203385

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