How Twitter conversations using hashtags #regionalanesthesia and #regionalanaesthesia have changed in the COVID-19 era

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INTRODUCTION
Within the regional anesthesiology and acute pain medicine (RAAPM) Twitter community, the two common hashtags are #regionalanesthesia and #regionalanaesthesia. Hashtags (words/phonemes following a “#” symbol) identify themed tweets.

Before COVID-19, a common RAAPM topic was opioids, and many fear the opioid epidemic will worsen post-pandemic. We tested the hypothesis that the proportion of #regionalanesthesia and #regionalanaesthesia tweets related to opioids has decreased since COVID-19.

METHODS
This project was deemed exempt by the institutional review board.

Study sample
English language tweets including #regionalanesthesia or #regionalanaesthesia were prospectively collected using TAGS V.6.1.9.1. The first tweet in either hashtag archive to reference COVID-19 was on March 18, 2020. We therefore set our convenience sample from February 1 through April 30, 2020, to compare tweets 6 weeks before (pre) and after (post) this seminal tweet. We included original tweets, replies, and retweets. We excluded duplicates and tweets lacking either hashtag.

Primary outcome
The primary outcome was the proportion of tweets during each time interval referencing opioids. Microsoft Excel (Redmond, Washington, USA) was used to search for opioid terminology and opioid names.

Secondary outcomes
Microsoft Excel was used to search broadly for terms related to COVID-19. Users were categorized manually by ERM and KMJ using Symplr Healthcare Stakeholder Definitions. Tweets were assigned to one of four published categories: scientific, logistical, social, or other. Inter-rater reliability for tweet categorization was determined using Cohen’s kappa statistic. The top 10 influencers were determined by tweets and impressions.

Statistical analysis
Statistical analysis was performed using NCSS Statistical Software (NCSS, Kaysville, Utah, USA) and IBM SPSS Statistics V.23 (IBM Corp., Armonk, New York, USA). The χ2 test with Yates correction was used for all comparisons of categorical data. For the primary outcome, a two-sided p<0.05 was considered statistically significant. All other analyzes were considered exploratory and not adjusted for multiple comparisons.

RESULTS
From 1603 individual tweets with #regionalanesthesia or #regionalanaesthesia, 1268 tweets comprised the final sample after de-duplication: 780 pre (210 original, 561 retweets, and 9 replies) and 488 post (184 original, 287 retweets, and 17 replies). Retweets decreased from 71.9% pre to 58.8% post (p<0.001); original tweets increased from 26.9% pre to 37.7% in the post interval (p<0.001).

Primary outcome
Opioid tweets decreased from 2.7% (21/780) pre to 0.4% (2/488) post (p=0.006).

Secondary outcomes
COVID-19 tweets increased from 0% pre to 26.6% (130/488) post (p<0.001). Doctors had the largest tweet decrease (~242 tweets), from 59.7% (466/780) pre to 43.9% (224/488) post (p<0.001).

Figure 1 Classification of original tweets using categories from Schwenk et al.: scientific (contained education, shared conference-related content, or other form of medical education; logistical (broadcasted information such as an announcement about an upcoming conference or job opening); social (general thoughts, banter or conversation, and replies); or other (any tweet that did not obviously fall into one of the other three categories, including advertising tweets). P values are derived from the χ2 test with Yates correction.

Check for updates
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Individual other health showed the largest tweet increase (+48 tweets), from 1.3% (10/780) pre to 11.9% (58/488) post (p<0.001). Cohen’s kappa statistic was 0.796 (“substantial” agreement between reviewers) for the categorization of 420 original tweets. From pre to post, the proportion of “other” tweets increased (figure 1). All 20 tweets in the “other” category were medical device advertisements.

Comparison of influencers
The top 10 influencers of #regionalanesthesia or #regionalanaesthesia in the pre and post intervals are shown in table 1.

**DISCUSSION**
This study reveals a focus shift within the RAAPM Twitter community since COVID-19 arrived with fewer mentions of the opioid epidemic and more industry advertisements using regional anesthesia hashtags. However, an overall decrease in activity among the top 10 influencers also occurred, which may relate to increased clinical demands on anesthesiologists during COVID-19 or an appropriate change in topical priorities to personal protective equipment and critical care skills. Given the ongoing overlap of the COVID-19 pandemic and opioid epidemic, we encourage physicians in the RAAPM Twitter community to continue to use these hashtags to help disseminate information on opioids and nerve blocks as elective surgeries.

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