Short communication

# Online social network response to studies on antidepressant use in pregnancy

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## A B S T R A C T

*Background:* About 8% of U.S women are prescribed antidepressant medications around the time of pregnancy. Decisions about medication use in pregnancy can be swayed by the opinion of family, friends and online media, sometimes beyond the advice offered by healthcare providers. Exploration of the online social network response to research on antidepressant use in pregnancy could provide insight about how to optimize decision-making in this complex area.
*Methods:* For all 17 research articles published on the safety of antidepressant use in pregnancy in 2012, we sought to explore online social network activity regarding antidepressant use in pregnancy, via Twitter, in the 48 h after a study was published, compared to the social network activity in the same period 1 week prior to each article's publication.
*Results:* Online social network activity about antidepressants in pregnancy quickly doubled upon study publication. The increased activity was driven by studies demonstrating harm associated with antidepressants, lower-quality studies, and studies where abstracts presented relative versus absolute risks.
*Implications:* These findings support a call for leadership from medical journals to consider how to best incentivize and support a balanced and clear translation of knowledge around antidepressant safety in pregnancy to their readership and the public.

## 1. Introduction

Untreated depression in pregnancy can negatively impact both mother and child. The decision to initiate or continue antidepressant therapy in pregnancy is influenced by several factors, including a small increased risk for certain adverse maternal and child outcomes [1]. Decisions about medication use in pregnancy are also swayed by the opinion of family, friends and online media, sometimes beyond the advice offered by healthcare providers [2]. Public opinion about antidepressants in pregnancy is unknown, especially that offered through social media soon after a related study is published. We explored Twitter-based activity about antidepressant use in pregnancy in relation to published studies. We then determined whether observed changes in Twitter-based activity differed by the nature of the study findings, study quality, or how the findings were presented in the paper's abstract, where first impressions of the study are formed.

## 2. Methods

Two authors (SV, HB) searched PubMed, Embase, PsycINFO and the Cochrane Library using terms related to antidepressants and pregnancy (S1), limiting the search to English-language studies published online or in print from February 1 to November 31, 2012. Included studies were
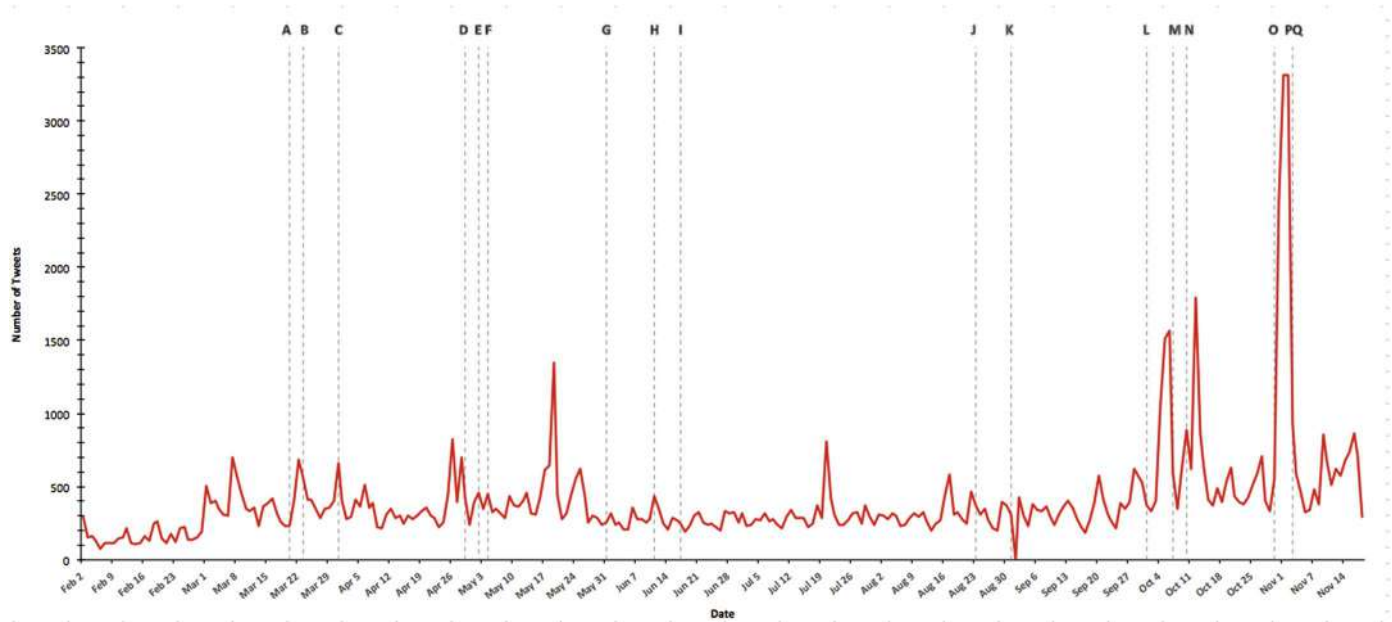
**Fig. 1.** Volume of tweets about antidepressants and pregnancy, assessed between February 1, 2012 and November 17, 2012. Each of the 17 published research studies is indicated by a grey vertical dashed line and its respective capital letter, as described in Supplementary File 3. The number of tweets about antidepressant use in pregnancy is shown in red. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

required to evaluate at least one maternal or child outcome in relation to antidepressant exposure in pregnancy, and have a non-exposed comparison group; systematic reviews were eligible. The same two authors extracted the study characteristics. Next, a publically available 2012 Twitter dataset was used, containing about 350 million anonymized tweets. A list of keywords was generated from a preliminary Twitter search of "antidepressants" and "pregnancy", with related words further added using automated word embedding learnt on the Twitter corpus [3], followed by manual removal of irrelevant terms (S2). 100 tweets were randomly selected to ensure operational relevance of the chosen Twitter search terms. A count of tweets about antidepressant use in pregnancy in the 48-hour period after each study was first published was compared to that in the 48-hour period seven days earlier, allowing comparisons by the same day of the week. Negative binomial regression was used to generate rate ratios (RR) and 95% confidence intervals (CI) for the comparisons overall, and stratified by study characteristics that might affect online social network response: (i) direction and magnitude of the results; (ii) whether analyses accounted for the key confounder of maternal mental illness, as a proxy of study quality [1]; and (iii) whether results in the abstract were presented as absolute risks.

### 3. Results

Of 823 non-duplicate citations, 105 full-text articles were assessed, and 17 met the eligibility criteria (S3). Baseline tweet volume was relatively consistent throughout the study period (Fig. 1). Overall, tweet volume doubled post- vs. pre-publication (RR 1.93, 95% CI 1.28–1.89). Volume specifically increased for studies published with a higher reported magnitude of harm, but not for studies whose analyses

accounted for maternal mental illness or studies that reported absolute risks in the abstract (Fig. 2).

### 4. Discussion

Online social network activity related to antidepressant use in pregnancy doubled soon after publication of a related research study. The amount of Twitter response to a newly published study was influenced by the magnitude and direction of a study's findings: an article reporting apparent harm from antidepressant use received more attention than that which conveyed reassurance. Twitter activity may also depend on how risk estimates are presented by a journal. This process is similar to how evidence is adopted by clinicians [4]. While the current study did not determine if the twitter discussion surrounding each study was of a positive or negative nature, the findings suggest that Twitter can provide insight about public perception and communication about antidepressant use in pregnancy, as previously shown for cardiovascular disease [5]. Furthermore, the current study may have important implications for patient decision-making, which requires an accurate view of the potential benefits and risks of a given set of treatment options [6]. If data from studies reporting harm are shared more frequently than those providing reassurance, then this may bias an informed decision-making process. As medical journals endeavor to ensure that their published studies are balanced and clear, they might also consider how their data will be rapidly disseminated and interpreted across social media platforms.
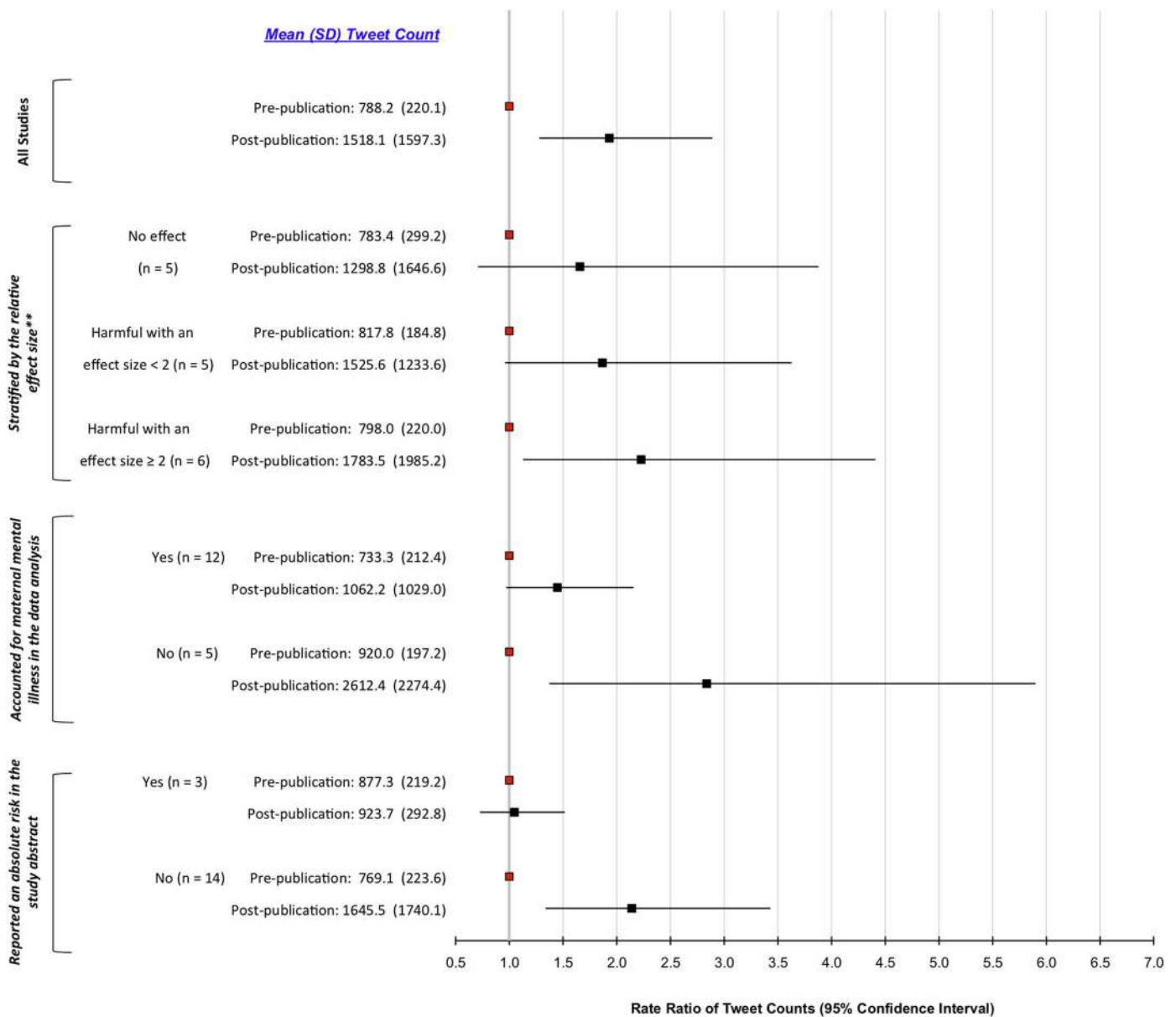
**Fig. 2.** Relative volume of tweets about antidepressant use in pregnancy in the 48-hour period after a related study was published compared to that 7 days earlier*. Rate ratios (RR) of tweet counts (and 95% confidence intervals, CI) were generated using negative binomial regression.

*For 2 studies, the referent days were − 14 and − 13 days before the study was published, as there was overlap at − 7 and − 6 days with the publication of another study.

**Considers a higher relative risk or odds ratio reported for any study outcome.

**Declaration of interest**

No authors have conflicts of interest to disclose.

**Appendix A. Supplementary data**

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jpsychores.2018.01.009.

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