Sins of the Father: Current Medical Guidance Based on Retracted Articles in the Literature

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Background

- Medical guidelines are evidence-based recommendations that guide healthcare professionals' decisions about patient care
- While these guidelines should be based on the best available scientific evidence, they may be updated relatively infrequently, which means they may cite articles that have subsequently been retracted for reasons including out-of-date evidence or experimental error
- This issue is compounded by the rapidly increasing number of retracted articles in the literature

Objective

- This study assessed the extent to which clinical guidelines cited retracted articles and whether these retractions were clearly indicated

Research design and methods

- Feet of Clay Detector[1] was used to identify clinical guidelines, position statements and consensus documents published since 1 January 2022 that cited ≥1 retracted references
  - Feet of Clay identifies articles citing papers flagged by the Annulled Detector,[2] which identifies articles that were published but the publishers have stated they should not be read, trusted, and cited any longer
- Confirmed guidelines were then evaluated to determine:
  - Whether the retracted article(s) had been marked as retracted (in the main text or the reference list)
  - Whether the retracted article(s) had been cited to support clinical guidance or as part of the background or introduction
  - The regional distribution of guidelines citing retracted articles (as Global, Latin America, USA and Canada, Europe, Asia, Rest of the World)
- The retracted articles cited were evaluated to determine the reasons for retraction based on simplified categories:
  - *Misconduct/Investigations* (including institutional investigations, falsification of data, plagiarism, ethical violation; where publications could be classified as either *Misconduct/Investigation* or *Data/Process* concerns, the former was used)
  - *Data/Process concerns* (concerns about data or methodology, process or breach of policy)
  - *Retract and replace* (indicates where a publication was updated to correct an error)
  - *Withdrawn* (includes 'removed' and 'out of date' tags)
  - *Duplicates*

Results

Topline analysis:

- We identified 238 guidelines, consensus documents and position statements that cited retracted articles, of which 46 were excluded (**Fig 1**). The analysis focused on the remaining 192 guidelines (total of 222 citations to 147 retracted articles
- The guidelines studied included widely used and cited guidelines from EU and US organisations, including the European Society of Cardiology, European Society of Hypertension, American Heart Association and American College of Cardiology
- Guidelines citing retracted articles were most commonly from Asia (37.6%), followed by Europe (25.4%), USA and Canada (11.7%), Global (13.2%), Rest of the World (8.1%) and Latin America (4.1%; note: some guidelines were classified as being from more than one region, e.g. US and Global)
- The guidelines themselves were cited an average of 45 times each, with 1 guideline cited 1594 times[3]

In-depth analysis of available guidelines and retracted articles:

- Of the 192 guidelines identified, 31 were behind a paywall and 13 were non-English language; 15 guidelines cited retracted articles that were unidentifiable (n=3) or inaccessible (n=12)
- For the remaining 133 guidelines, citing 155 retracted articles, the retracted citations were only marked as such in 1.5% (2/133) of the guidelines (equating to 1.3% [2/155] of retracted articles marked as such wherever cited; **Fig 2**)
- Reasons for the retractions were not always provided; however, the reason for the retraction was available for 72.8% (107/147) of the retracted articles that were cited
- The most common reasons for retraction were *Data/Process concerns* or *Misconduct/Investigations* (see **Fig 3**)

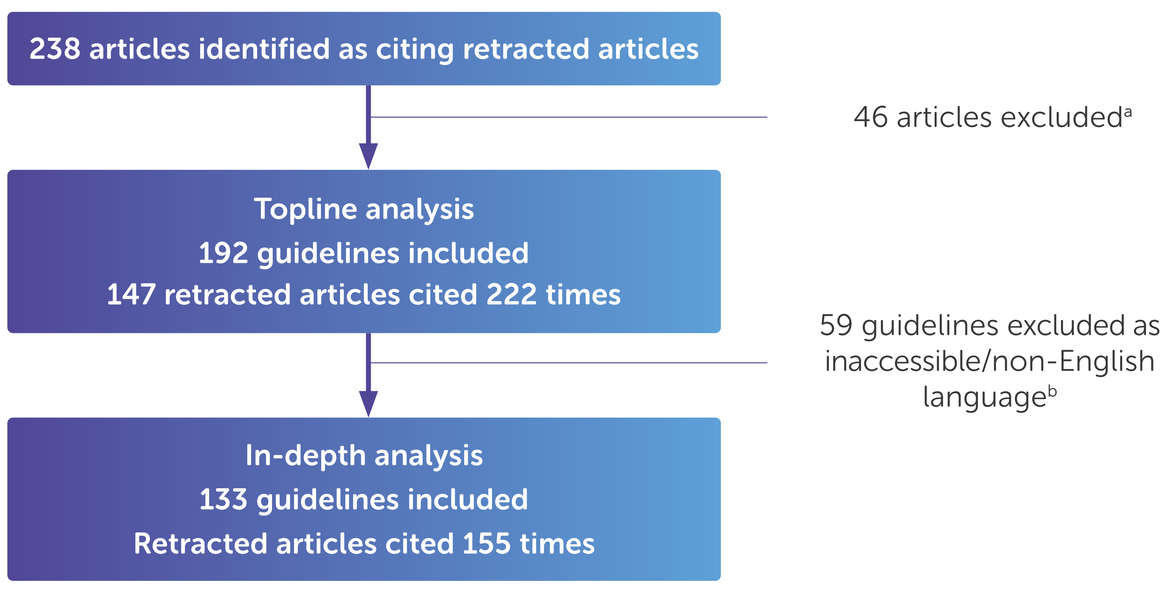
Limitations:

- The main limitation of this analysis was the accessibility of full-text guidelines and retracted articles:
  - Not all of these were available online (e.g. all the digital object identifier [DOI] links for 1 Chinese publisher returned a '501 error')
  - Some full-text articles could not be checked as they were not in English
  - Articles behind a paywall were not included
- In addition, some duplicate publications not included in the analysis may have been guidelines legitimately published in more than 1 journal

Conclusions

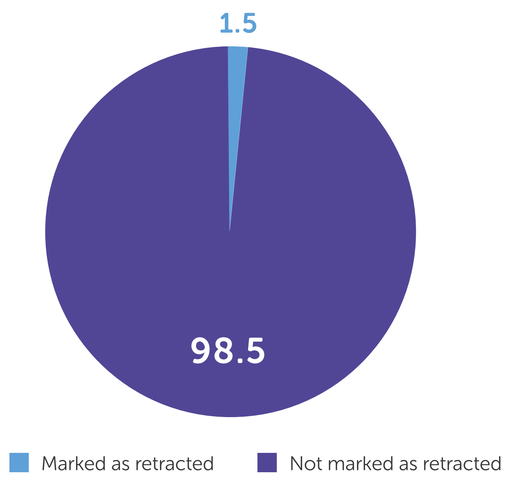
- **This study assessed the extent to which clinical guidelines cite retracted articles and whether these retractions were clearly indicated**
- **We identified 192 clinical guidelines published since January 2022 that cited retracted articles**
- **Retracted citations were marked as such in only <2% of the guidelines despite being used to directly support guidance in >38% of the guidelines**
- **These findings highlight the need for retracted articles to be marked wherever they are cited to prevent clinical decisions from being made based on potentially incorrect information**

Fig 1. Overall, 192 guidelines were identified with a total of 222 citations to 147 retracted articles



[a]Non-official guidelines, Delphi consensus, review articles or editorials, workbooks, permitted duplicate guideline publications; [b]Some guidelines cited more than 1 retracted article and different guidelines cited the same retracted articles, resulting in 222 citations but only 147 retracted articles.

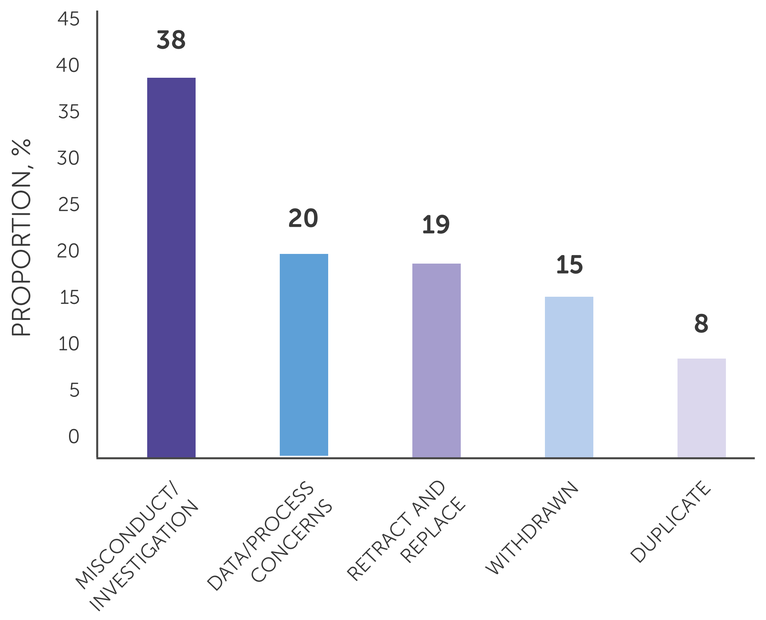
Fig 2. Only 1.5% (2/133) of guidelines indicated that retracted articles had been cited[c]



- 1 retracted article was cited by 13 separate guidelines
- Retracted citations were used to support guidance in 39% (52/133) of articles
- 88% (169/192) of guidelines cited 1 article; however, 12% (23/192) cited ≥2 articles[d]
- 1.3% (2/155) of retracted articles were marked as such wherever cited

[c]Of 192 guidelines identified, only 133 full-text guidelines could be accessed for the in-depth analysis.
[d]169 guidelines cited 1 retracted article, 16 cited 2, 6 cited 3 and 1 guideline cited 4 retracted articles, with 1 retracted article cited across 13 different guidelines.

Fig 3. The most common reasons for retraction were data concerns or misconduct/institutional investigations



[d]Reasons for the retraction were not always given in the database or by publishers; reasons available for 73% (107/147) of retracted articles cited in guidelines.

References

1. Feet of Clay Detector: https://dbrech.irit.fr/pls/apex/f?p=9999:31.
2. Annulled Detector: https://dbrech.irit.fr/pls/apex/f?p=9999:33.
3. 2022 ESC/ERS Guidelines for the diagnosis and treatment of pulmonary hypertension. Eur Heart J. 43(38):3618-3731. https://doi.org/10.1093/eurheartj/ehac237.

Disclosures

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