A Review of Current Reporting of Abdominal Aortic Aneurysm Mortality and Prevalence in the Literature

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WHAT THIS PAPER ADDS

Abdominal aortic aneurysm (AAA) epidemiology is changing and references for AAA mortality and prevalence reported in the current literature may therefore be subject to error if historical and outdated data are used. This study highlights inaccuracies in the reporting of AAA mortality and prevalence data and the importance of accurate citations.

Background: It is common for authors to introduce a paper by demonstrating the importance of the clinical condition being addressed, usually by quoting data such as mortality and prevalence rates. Abdominal aortic aneurysm (AAA) epidemiology is changing, and therefore such figures for AAA are subject to error. The aim of this study was to analyse the accuracy of AAA prevalence and mortality citations in the contemporaneous literature.
Methods: Two separate literature searches were performed using PubMed to identify studies reporting either aneurysm prevalence or mortality. The first 40 articles or those published over the last 2 years were included in each search to provide a snapshot of current trends. For a prevalence citation to be appropriate, a paper had to cite an original article publishing its own prevalence of AAA or a national report. In addition, the cited prevalence should match that published within the referenced article. These reported statistics were compared with the most recent data on aneurysm-related mortality.
Results: The prevalence of AAA was reported to be as low as 1% and as high as 12.7% (mean 5.7%, median 5%). Only 47.5% of studies had referenced original articles, national reports or NICE, and only 32.4% of cited prevalences matched those from the referenced article. In total 5/40 studies were completely accurate. 80% of studies cited aneurysm mortality in the USA, with the majority stating 15,000 deaths per year (range 9,000 to 30,000). Current USA crude AAA mortality is 6,289 (2010).
Conclusion: References for AAA mortality and prevalence reported in the current literature are often inaccurate. This study highlights the importance of accurately reporting mortality and prevalence data and using up-to-date citations.

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INTRODUCTION

It is common for authors to introduce a paper by demonstrating the importance of the clinical condition being addressed, by quoting data such as mortality and prevalence rates. Abdominal aortic aneurysm (AAA) epidemiology is changing, and although AAA prevalence and mortality increased throughout the 20th century, it is now on the decline as reported by Choke[1] and Anjum.[2] AAA prevalence and mortality is routinely reported in articles to emphasise the importance and burden of the disease; however, there is marked variation in reported figures, therefore the aim of this study is to provide a snapshot of current trends in citations for AAA prevalence and mortality.

METHODS

Two separate literature searches were performed for (a) aneurysm prevalence and (b) aneurysm mortality. Literature searches were performed in February 2013 for aneurysm prevalence and June 2013 for aneurysm mortality, respectively, on PubMed, using the same search criteria. The search terms "abdominal AND aortic AND aneurysm NOT thoracic" were used. Studies directly investigating aneurysm epidemiology were excluded as the aim was to study cited prevalence and mortality rather than current investigations into these. As the aim of this study was to provide a snapshot, only studies accessible by this institution were included because of the vast number of journals publishing

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papers related to AAAs. The first 40 studies published within the previous 2 years stating aneurysm prevalence and mortality were included in order to ensure the data gathered for the study were indicative of current trends.

The most recent data on aneurysm-related mortality was obtained from the World Health Organization (WHO) mortality database and the Centers for Disease Control and Prevention (CDC). The most recent data for the USA, UK, and Germany were from 2010, and data from Italy were from 2009. The definition of aneurysm mortality within this study was International Classification of Diseases 10th edition (ICD-10) codes I71.3–I71.9, which represents abdominal and thoracoabdominal aortic aneurysms, ruptured or otherwise, and aortic aneurysms of unspecified site. These were included to ensure that all AAAs were included in the analysis, although ICD-10 codes I71.1 and I71.2 indicating thoracic aneurysms were excluded. Reported mortality data for AAA were extracted and compared against the most up-to-date WHO/CDC data for each country. Current crude AAA mortality in the USA, UK, Germany and Italy is 6,289, 5,251, 1,251, and 2,073, respectively. Excel 2010 was used for data analysis.

For a prevalence citation to be defined as appropriate, a paper had to cite an original article publishing primary data reporting the prevalence of AAA (i.e. not a review, editorial, or commentary), or a national report such as the aneurysm screening programme. In addition, we examined the accuracy of the citation in relation to the article that had been referenced. An overall correct citation was deemed to be one both citing an appropriate article and matching the prevalence reported in the cited article.

RESULTS

Cited aneurysm prevalence

The literature search identified one commentary, one short report, three review articles, and 35 original articles reporting aneurysm prevalence, all published between 2012 and 2013. Nineteen articles reported a single prevalence, with 21 articles reporting a range of prevalences. These 40 articles referenced a total of 35 papers, with the most recent referenced paper having been published in 2012 and the oldest published in 1988 (Supplemental Table 1, available online).

The range of reported prevalences was from 1.7% to 12.7% with the most common references to original articles by Svensjö (2011; four citations),[1] Nordon (2011; four citations),[3] and Lederle (2000; four citations).[4] Although the paper by Svensjö[5] identified an AAA incidence of 1.7% in 65-year-old men from the aneurysm screening programme, 0.5% of men were known to have an AAA and therefore were not invited to screening, resulting in a prevalence of 2.2% in the population. Four papers referenced Svensjö,[5] from which one paper used the correct aneurysm prevalence. Nordon et al.[3] reported a prevalence ranging from 4.0% to 8.0% in men, which was correctly cited twice out of four articles. Lederle et al.[4] demonstrated an overall prevalence of 4.2%, from which one out of four papers referenced this correctly.

Analysing the 40 papers identified, a total of five papers had cited both original articles and stated the correct prevalence from the referencing article. Nineteen papers referenced appropriate articles, 13 papers referenced review articles, meta-analyses unrelated to prevalence, or seminars, and six papers did not state a reference. Two studies referenced a combination of original and review articles. In only 11 out of 34 papers did the cited aneurysm prevalence, in each cited article, match that of the referenced article(s).

Cited aneurysm mortality

Literature searches identified one editorial, one short report, seven review articles or meta-analyses, and 31 original articles referencing aneurysm mortality. All articles were published between 2011 and 2013. A total of 38 articles reported a single mortality figure, with two articles reporting data from two countries. The most recent reference was from 2013, with the oldest from 1993; however, eight studies included no reference (Supplemental Table 2, available online). Only a single study[6] reported the correct current aneurysm mortality.

The majority of studies (31) cited aneurysm mortality in the USA, with the majority stating 15,000 deaths per year (range 9,000 to 30,000). Eight studies cited aneurysm mortality from the UK (either UK, England and Wales, or UK and Ireland) with the majority stating either 6,000 or 8,000 deaths per year (range 4,000 to 10,000). There were also single studies that cited aneurysm mortality in Germany (1,251) and Italy (6,000); however, one study did not state a country. Analysing these results there is an overall trend for over-reporting of aneurysm mortality.

DISCUSSION

This study has identified inaccuracies in secondary reporting for AAA prevalence, and aneurysm mortality, with the majority of papers over-reporting the burden of disease. Recent implementation of screening programmes throughout the world[7] and a wealth of high-quality research in AAA epidemiology have drawn attention to the decreasing prevalence and mortality from AAA, and accurate reporting of disease burden is essential to maintain the integrity of research reports. The range of reported AAA prevalence was from 1.7% to 12.7%, showing marked variability. This is in part because of the prevalence of disease changing with age, and some studies reporting aneurysm prevalence in patients aged 80–85;[8] however, the oldest reference was from 1988, which may not represent current trends. Less than one-third of studies accurately cited the prevalence from their referenced article. Mortality from AAA is typically reported as a crude figure with no adjustment for population size. The most common mortality figure from the USA was 15,000 deaths per year, with this figure being cited from 11 different sources between 1995 and 2011; however, the most up-to-date reported AAA-

related mortality in the USA is 6,289 (2010). The earliest aneurysm mortality data from the WHO database and CDC in the USA was 10,464 in 1999, which remains lower than most reported mortality data, even when adding in ICD-10 codes I71.1 and I71.2 relating to thoracic disease (totalling 12,434 deaths). References from the UK also ranged from 4,000 to 10,000 deaths per year between 1993 and 2012. The earliest available UK aneurysm mortality data from the WHO database (2001) was 7,176; however, when including ICD-10 codes I71.1—2 this rose to 7,987. This suggests that the inaccurate mortality figures are not caused by the aggregation of AAA and thoracic data.

A total of 12 studies cited data from government bodies, national statistics publications, or executive committee reviews. The reporting of statistics from review articles or original articles not primarily addressing mortality or prevalence data may be inaccurate and outdated.

This study has provided a snapshot of current reported AAA prevalence and mortality data, and drawn attention to the inaccuracies therein; however, it is not without limitations of its own. The search for this study is not comprehensive, because of the limitations of accessing published articles within this institution. As an example, using our search criteria 952 studies within 2012 were published; however, not all of these were accessible, and as such citations from certain journals were not possible. Another limitation of this study is determining which ICD-10 codes to use. We have opted to exclude known thoracic aneurysms and dissections; however, we have not excluded thoracoabdominal aneurysms or aneurysms of unspecified site in order to capture as many abdominal aneurysm deaths as possible. In addition, the calculated mortality data within this study rely upon the data submitted to the WHO or CDC from each country, and unless post-mortem is carried out it is possible that AAA-related mortality is missed. Also several journals limit the number of citations, particularly with regards to short reports, therefore aneurysm prevalence or mortality may not be cited for this reason. It can also be difficult to obtain up-to-date government mortality and prevalence data. Despite the limitations of this study, the data suggest that improvements in citations of both aneurysm prevalence and mortality are required.

CONCLUSION

References for AAA mortality and prevalence are often inaccurate, which may confound our current understanding of the burden of disease. By referencing up-to-date national data and original articles primarily addressing mortality and/or prevalence of AAA, we can accurately highlight the impact of AAA.

CONFLICT OF INTEREST

None.

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APPENDIX A. SUPPLEMENTARY DATA

Supplementary data related to this article can be found online at http://dx.doi.org/10.1016/j.ejvs.2013.11.007.

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