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Do citation classics in rhinology reflect utility rather than quality?*

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SUMMARY

Citation rates have been suggested to be more of an indicator of utility than quality. The aim of this study was to apply measures of utility and quality to articles identified as citation classics in rhinology/anterior skull base surgery. There were 14 articles analysed in the study. The assessment of quality was performed by combining factors from previous publications on quality assessment and the various elements were categorised into four groups; quality of written article and publication, quality of research, quality of evidence-based methodology and quality of outcome. This study revealed that citation classics in rhinology/anterior skull base surgery were well-written and satisfied peer review in reputable journals in the specialty. Quality is satisfied by clarity of exposition and patient numbers. The research was generally asking an important question and the methodology overall was adequate and appropriate for the type of study performed. A good quality of research and outcome was demonstrated with a definite historical importance, and reports that stimulated further research and enquiry. Quality is not satisfied by the lack of randomised controlled trials, appropriate statistical analysis or patient criteria. In conclusion citation rates when considered as an individual measure, reflect utility rather than quality.

Key words: publication, citation, quality assessment

INTRODUCTION

A need has been identified for more scholarly output and better quality research in otolaryngology / head and neck surgery [1, 2]. The ideal tool for assessing the quality of research is not available and an accepted gold-standard of quality assessment may never be attainable [2, 3]. The standard of evidence-based medical (EBM) literature is graded on a hierarchical scale in a system, which equates best quality with randomized controlled trials (RCT) or meta-analyses [2]. EBM is concerned with finding the best evidence for clinical decision-making and at the lower end of the evidence scale, case series and reports have entirely different aims including discovery, recognition that may lead to more scientific evaluation and possible catalysts for further investigation [4, 5]. These forms of publication are not automatically inferior to the more scientific RCT articles and they all have a place in medical research [6].

Quality is a complex concept and is not easy to measure nor has it been defined as to who should perform the assessment [7]. Attempts to provide reproducible assessments of quality in medical publications have included the quality of the written article, the research topic, the research methods involved and the consequences of the relevant studies [8-11]. The two principal approaches to quality assessment in RCTs are to focus on the components of the methodology such as randomisation and blinding or to use a criteria list to provide a quality score [3]. There are an ever-increasing number of quality scales available in the literature but at the very minimum, a prospective survey must include appropriate statistical analysis and satisfactory internal and external validity [3, 12]. The research subject and study must be relevant, follow strict ethical principles with declaration, if indicated, of any relevant conflicts of interest [7]. An article reporting on such an investigation should be well-written in clear unambiguous language and presented with an appropriate discussion and relevant conclusion and published in a reputable journal to complete the initial cycle of quality [7]. Ultimate recognition of an outstanding article must include the impact that the relevant publication had on the scientific community and on clinical practice [11].

Citation rates have been suggested as an objective measure of quality but some authors have refuted this to be more of an indicator of utility than quality [13-15]. Citation Classics have been described as the top-percentile of cited articles and further refined in smaller specialties to those that have received 100 or more citations [13, 16]. Eighty citation classics

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have been reported in OHNS and the subgroup of articles concerning rhinology and anterior skull base surgery was chosen for assessing the application of citation rate to utility and quality [17].

METHODS

Articles on Rhinology / Anterior Skull Base surgery were identified from the complete list of citation classics in otolaryngology / head and neck surgery [17]. It was deemed appropriate that utility would be assessed by citation rates, as it would not be possible to measure regular usage [18]. The assessment of quality was performed by combining factors from previous publications on quality assessment and the various elements were categorised into four groups (Tables 1-4); quality of the written article and publication, quality of research topic, quality of evidence-based methodology and quality of outcome [7-12, 19].

Each original article was obtained from Mid Western Regional Hospital library or its interlibrary lending service. The criteria in Tables 1-4 were applied to each report. They were also assessed for: publication rate and rank, year and decade of publication, author and country of origin of the research, and the subject and topic of the research.

RESULTS

Fourteen articles were identified and the citation of each is presented in Table 5 with the relevant rate and rank of the citation score. All papers underwent peer-review and were published in a prestigious international journal. Twelve institutions in 4 countries produced the relevant research; USA 10, Austria 2, Canada and Sweden 1. Six papers were retrospective descriptive reviews, four involved reviews, two were experimental studies and there were two case series. The patient range was 3-315 (mean: 137) in the descriptive reviews and 10-202 (mean: 111) in the case series respectively. Functional endoscopic sinus surgery occupied the authors in seven articles; fungal infection was the topic of research in two and the remainder included articles on the nasal valve, nasal cilia, Substance P, papillomas and a classification of the orbital complications of sinusitis. There was appropriate use of statistics in one article and none of the remainder provided any statistical analysis. None of the articles were considered evidenced-based although all addressed a clinically relevant issue. Three articles were considered to be recognition of previous work. None of the research had patient allocation or treatment blinding.

DISCUSSION

Few journal articles in the specialty of OHNS have addressed the concept of quality assessment in health research and fewer have attempted to provide a reproducible template for estimation of quality in published papers. The quality of research publication is multi-factorial and is not dependent on any single factor. Most criteria lists to assess the methodological quality of RCTs do not explicitly define the concept of quality [3].

Table 1. Quality of written article & publication.

Reputation of journal & impact factor
Appropriateness for journal
Clarity of exposition
Appropriate discussion and conclusion
Satisfaction of read

Table 2. Quality of research topic.

Ethical permission
Theoretic perspective / Importance of question
Originality of research
Pioneering / Historical
Relevance to clinical practice
Conflict of interest

Table 3. Evidenced-based methodology utilised.

Statistical analysis
Appropriate methods
Sample size / Power
Internal validity
(The degree to which the trial design, conduct, analysis and presentation have minimised or avoided biased comparisons of the interventions under evaluation.)
Study design
Random allocation / Method of randomisation
Patients blinded to treatment / Blind assessment of outcome
Method of data collection
Treatment complications / Loss to follow-up
External validity
(The precision and extent to which it is possible to generalise the results of the trial to other settings)
Characteristics of study participants
Presence or absence of control group
Eligibility criteria / Admission before allocation

Table 4. Quality of Outcome.

Citation rate
Expands or challenges current knowledge
Opens a pathway to advance knowledge
Integrates discoveries obtained by different approaches, then bringing new insights
Adds consequentially to the field through original innovative research findings
Opens additional areas for new research activity
Reflects critically on research findings to guide the direction of further research

Table 5. Classic Citations in rhinology/anterior skull base surgery tabulated and ranked in order of number of citations received (in square parentheses) and full reference.

1. [255] Kennedy DW, Zinreich SJ, Rosenbaum AE, Johns ME (1985). Functional endoscopic sinus surgery-Theory and diagnostic evaluation. Arch Otolaryngol Head Neck Surg; 111(9): 576-582.
2. [223] Stammberger H (1986). Endoscopic endonasal surgery- concepts in treatment of recurring rhinosinusitis. Anatomic and pathophysiologic considerations. Otolaryngol Head Neck Surg; 94 (2): 143-147.
3. [182] Kennedy DW (1985). Functional endoscopic sinus surgery - technique. Arch Otolaryngol; 111(10): 643-649.
4. [155] Hyams V (1971). Papillomas of the nasal cavity and paranasal sinuses. A clinicopathological study of 315 cases. Ann Otol Rhinol Larynol; 80(2): 192-206.
5. [153] McGill TJ, Simpson G, Healy GB (1980). Fulminant aspergillosis of the nose and paranasal sinuses: a new clinical entity. Laryngoscope; 90: 748-754.
6. [144] Stammberger H (1986). Endoscopic endonasal surgery- concepts in treatment of recurring rhinosinusitis. 2. Surgical technique. Otolaryngol Head Neck Surg; 94(2): 147-156.
7. [142] Chandler JR; Langenbrunner DJ; Stevens ER (1970). The pathogenesis of orbital complications in acute sinusitis. Laryngoscope; 80(9): 1414-1428.
8. [134] Haight JSJ, Cole P (1983). The site and function of the nasal valve. Laryngoscope; 93 (1), 49-55.
9. [127] Lundblad L, Lundberg JM, Brodin E, Anggard A (1983). Origin and distribution of capsaicin sensitive substance P-immunoreactive nerves in the nasal mucosa. Acta Otolaryngol; 96(5-6): 485-493
10. [111] Lucas AM, Douglas LC (1934). Principles underlying ciliary activity in the respiratory tract. Arch Otolaryngol Head Neck Surg; 20: 518-541
11. [107] Bolger WE, Butzin CA, Parsons DS (1991). Paranasal sinus bony anatomic variations and mucosal abnormalities – CT analysis for endoscopic sinus surgery. Laryngoscope; 101(1): 56-64
12. [106] Levine HL (1990). Functional endoscopic sinus surgery- Evaluation, surgery and follow up of 250 patients. Laryngoscope; 100(1): 79-84.
13. [100] Blitzer A; Lawson W; Meyers BR, Biller HF (1980). Patient survival factors in paranasal sinus mucormycosis. Laryngoscope; 90(4): 635-648
14. [100] Stankiewicz JA (1987). Complications of endoscopic intranasal ethmoidectomy. Larygoscope; 97(11): 1270-1273.

All published research has a place on the spectrum of medical enquiry and knowledge and therefore quality cannot be prejudged on whether the study is a randomised controlled trial (RCT) or case series. Different types of research are needed to answer different types of clinical questions [20]. It has been reported that 80% of ENT practice is based on clinical series and only 8% on RCT and that as most decisions are based on accepted protocols, RCTs may not be indicated or may not be practical in a surgical setting [2, 21-22]. Furthermore if clinical equipoise or the uncertainty principle is considered, and an individual or group are of the opinion that a specific treatment is superior to another, it may not be ethical to perform a RCT [23]. There have been reports on the appropriate methods required for randomised controlled trials but adequate grading of quality of evidence goes beyond the categorisation of research [20].

Citation data is often used to evaluate the merit of research due to the lack of reliable measurements of quality [24]. Citations may be more strongly influenced by the reputation of the publishing journal than by the design merits of the study [18]. Aside from the impact factor of the journal, the only other major predictors of citation were subjectiveness, sample size and presence of a control group [18]. The top 50 landmark articles in JAMA, adjudged by a number of criteria and experts, included only 13 of the top-cited list of papers published in that journal [13]. Leading journals attract the best-cited publications which in turn maintain the high impact factor of the journals [25]. The citation database was primarily developed for bibliometric use and not bibliometric analysis [24]. The primary function is to help a more comprehensive literature search and not as a measure of quality related to funding. There is no doubt that citation rates are a measure of utility and as most citations are positive, as a general rule they can be considered a measure of quality [18].

This study revealed that citation classics in rhinology / anterior skull base surgery were well-written and satisfied peer review in reputable journals in the specialty. The research was generally asking an important question and the theoretic perspective was appropriate. The methodology overall was adequate and appropriate for the type of study performed. We found a good quality of research and outcome, definite historical importance, pioneering approaches and reports that stimulated further research and enquiry. Quality is satisfied by clarity of exposition, journal published and patient numbers. Quality is not satisfied by the lack of randomised controlled trials, appropriate statistical analysis or patient criteria. The articles range from 1934-1991 and it is unfair to apply modern criteria to historical and pioneering papers that satisfied editorial review at the relevant period. The topics confirm that to produce a classic, one must present a clinical or non-clinical observation, innovation or discovery that has a longstanding effect on the way the specialty is practised [25].

Articles must be read in order to judge their quality and not be classified solely according to their citation rates [11]. Citation rates are certainly a measure of quality but should be considered a single component of a multi-faceted assessment. They are by definition a measure of utility and are one of the few methods available to measure the impact of an article on the scientific community [24]. Citation classics in rhinology demonstrate utility and quality of the written research report, research and outcome but fail to demonstrate quality of evidenced-based research methodology. It is important not to denounce citation rates but more germane to condemn their role as sole indicators of quality and quality-related funding. This article was an attempt to assess all aspects of quality in research articles and as outlined in Tables 1-4, citation rates are a small but definite component of quality assessment. However, taken as an individual measure they reflect utility rather than quality.

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