

Supplementary Material

Search criteria and strategy

An electronic search of PubMed, Embase, and Web of Science was performed to retrieve published articles related to postoperative strokes that were published from January 1970 through December 2017. The search was completed by combining keywords for stroke (stroke OR Cerebrovascular accident OR CVA OR Cerebral ischemia OR Brain ischemia) with surgery-specific key terms (postoperative OR perioperative OR post-operative OR peri-operative OR postprocedural OR post-procedural OR postsurgical OR post-surgical OR postoperative care OR post-operative care OR surgical patient OR postoperative complication OR post-operative complication). For Pubmed, the terms (prospective studies[mesh:noexp] OR prospective[TIAB]) were used to specify prospective studies only. The search criteria and inclusion/exclusion criteria were created in a way to minimize bias commonly encountered in observational studies. The Quality Assessment of Diagnostic Accuracy Studies, version 2, was performed to evaluate for bias and to determine whether the chosen studies were relevant to the review question.

Inclusion & exclusion criteria for study selection

The inclusion criteria included the following: (1) all prospective studies, (2) incident postoperative stroke that was identified using criteria for the study, (3) studies inclusive of postoperative neurological outcomes within 30 days postoperative, (4) reported quantitative data, (5) studies published in English, (6) studies that included an abstract, and (7) studies done on 100 patients or more.

Data extraction

Two authors (R.A. and E.J.) independently reviewed all the titles and abstracts of the articles from the electronic search to identify those that satisfied all the inclusion criteria, and a

third researcher (K.A.) settled any disagreements. Simultaneously, an Excel spreadsheet was constructed by each author outlining the articles to be excluded—the reason why a study was eliminated was indicated by a number corresponding to the inclusion criteria that was not met. A third author reconciled inclusion/exclusion disagreements and assembled a final list of studies for this review. The following data were extracted from each study: author name and year, sample size, the incidence of perioperative stroke, number of strokes.

Search results

A search was conducted on December 18, 2017 using the terms mentioned and resulted with total 4,035 references, 870 duplicates were removed from the three databases using endnote, leaving 3,166 potential references. Looking further into the abstracts of the references, 2,830 articles were excluded after title/abstract screening; 484 were not prospective studies, 1,578 the incidence of perioperative stroke and neurologic outcome was not identified within 30 days, 335 had a sample size of fewer than 100 patients, six studies were not performed on humans and 427 were more duplicated studies found, leaving 336 articles.

After full-text screen, 187 articles were qualified for data extraction. The overall sample size is 184,922 patients that had an incidence of perioperative stroke ranging from 0% to 13.86%. Studies that provided information about perioperative strokes occurring in cardiovascular and non-cardiovascular procedures, comprised of a total cohort of 145,714 and 39,208. The highest three countries that had the most published papers in our search were United State (58 papers; 75,456 patients), Italy (23 papers; 15,703 patients), and Germany (21 papers; 11,814 patients). From the 58 papers published in the United States, there were 57 papers on cardiovascular procedures and one paper on noncardiovascular procedures.