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Research hotspots analysis of intracerebral hemorrhage puncture-draining by PubMed

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ABSTRACT

Objective: To understand the research hotspots of punctures to ICH by Pubmed. With MS Excel, SPSS, Cytoscape software, we took MeSH (Medical Subject Headings) word frequency analysis, clustering analysis, co-word network graph of PubMed papers. **Results:** It shows that the Punctures to ICH research hotspots had focus on lumbar puncture and hematoma, Stereotaxic Techniques, Stereotaxic Techniques, etc, also the most importance of which was the lumbar puncture.

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KEYWORDS

Intracerebral hemorrhage;
Punctures;
Word frequency analysis;
Clustering analysis;
Co-word network graph;
Lumbar puncture.

INTRODUCTION

Intracerebral hemorrhage (ICH) is a devastating disease with high rates of mortality and morbidity^[1]. Approximately 10% to 23% of strokes are caused by the rupture of cerebral blood vessels^[2,3]. and the overall ICH incidence worldwide is 24.6 per 100 000 person-years^[4]. Hypertension and arteriosclerosis are two of the top causes of ICH. It was important that therapy to deal with surgery puncture-draining for the prognosis of ICH, we hope that through this research the analysis of the MeSH can draw the outline of ICH puncture-draining research hotspots.

Therefore this research retrieved the ICH puncture-draining papers of PubMed (<http://www.ncbi.nlm.nih.gov/pubmed>) within recent 214 papers, and analyzed MeSH of above papers using Co-

word Analysis^[5].

MATERIAL AND METHODS

We retrieved PubMed papers with default publication dates on 10 November 2013. First, search terms was "Punctures "[Mesh] AND "Cerebral Hemorrhage"[Mesh]; Second, using Microsoft Excel we recorded All MeSH terms of above papers, and sort and filter the terms, and looked for the high frequency terms (occurrences), and we also counted occurrences of two high frequency terms together in the same paper, setting up the original co-word matrix. Third, the statistical analysis: we made MeSH term's clustering analysis using SPSS 13.0 statistical software, draw the co-word network graph of the high frequency terms using Cytoscape software^[6].

THE MESH TERMS ANALYSIS OF PAPERS ABOUT ICH PUNCTURE-DRAINING

The MeSH terms word frequency analysis

We retrieved 214 papers, every paper has MeSH terms, we extracted MeSH terms and established the MeSH terms database. We got 26 MeSH terms of ICH puncture-draining which occurrences frequency was over 5 (including 5). From TABLE 1, we can infered some ideas: the relevant research hotspots of ICH puncture-draining mainly concentrated in the Spinal Punc-

TABLE 1 : The top 26 MeSH terms about ICH puncture-draining

| Ranking | MeSH terms | Occurrences Frequency (times) |
|---------|-----------------------------|-------------------------------|
| 1 | Cerebral Hemorrhage | 127 |
| 2 | Spinal Puncture | 53 |
| 3 | Hydrocephalus | 29 |
| 4 | Hematoma | 22 |
| 5 | Infant, Premature, Diseases | 20 |
| 6 | Stereotaxic Techniques | 18 |
| 7 | Stereotaxic Techniques | 15 |
| 8 | Tomography, X-Ray Computed | 15 |
| 9 | Biopsy, Needle | 14 |
| 10 | Brain Neoplasms | 13 |
| 11 | Cerebral Ventricles | 13 |
| 12 | Cerebrovascular Disorders | 12 |
| 13 | Intracranial Aneurysm | 11 |
| 14 | Brain | 9 |
| 15 | Infant, Newborn, Diseases | 9 |
| 16 | Brain Diseases | 8 |
| 17 | Brain Injuries | 7 |
| 18 | Drainage | 7 |
| 19 | Cerebral Angiography | 6 |
| 20 | Subarachnoid Hemorrhage | 6 |
| 21 | Cerebrospinal Fluid Shunts | 6 |
| 22 | Blood Specimen Collection | 5 |
| 23 | Neurosurgery | 5 |
| 24 | Cerebrospinal Fluid | 5 |
| 25 | Brain Abscess | 5 |
| 26 | Intracranial Pressure | 5 |

ture, Hematoma, Stereotaxic Techniques, punctures, etc. it also suggests that Spinal Puncture has become ICH puncture-draining the most major research hotspots.

Clustering analysis of the high frequency MeSH terms

This research used hierarchical clustering analysis which is one of the most commonly used Classify analysis to analyze the above 21 MeSH terms, drew a dendrogram, and the results were shown in Figure 1.

From the Figure 1, except individual MeSH term as “ Infant, Newborn, Diseases”, we could seen the other high frequency MeSH terms could be divided into the following four groups. Group 1 contains MeSH terms (Cerebral Hemorrhage; Cerebral Angiography; Spinal Puncture; Intracranial Aneurysm; Subarachnoid Hemorrhage), it suggests that Cerebral Hemorrhage such as Subarachnoid Hemorrhage are usually caused by aneurysm, it to be diagnosed by cerebral angiography. The treatment of complication with spinal puncture. Group 2 contains MeSH terms (Infant, Premature, Diseases; Cerebrospinal Fluid Shunts; Hydrocephalus; Punctures; Cerebral Ventricles), It suggest that infant, premature dieases were often to combined with hydrocephalus that were be treatment with fluid shunts. Group 3 contains MeSH (Stereotaxic Techniques; Biopsy, Needle; Tomography, X-Ray Computed; Brain Diseases; Brain; Brain Neoplasms), it suggest that Brain Neoplasms were diagnosed by Tomography, X-Ray Computed Tomography, Biopsy with needle by sterotaxic techniques. Group 4 contains MeSH (Brain Injuries; Drainage; Hematoma; Cerebrovascular Disorders), it suggest that Brain injuries and Cerbrovascular Disorders were often complicated with Hematoma, it were be treated with drainage at times.

The above clustering results suggest that several MeSH terms within one group have certain inherent logic connection between eachother; If there are no known correlation between the MeSH terms, it indicates we find a new research hotspot.

Co-word network graph of the high frequency MeSH terms pair

By analyzing MeSH terms of the top 13 (word frequency), we got the top 12 MeSH terms pair (A and B, see TABLE 2) and co-word network graph of the

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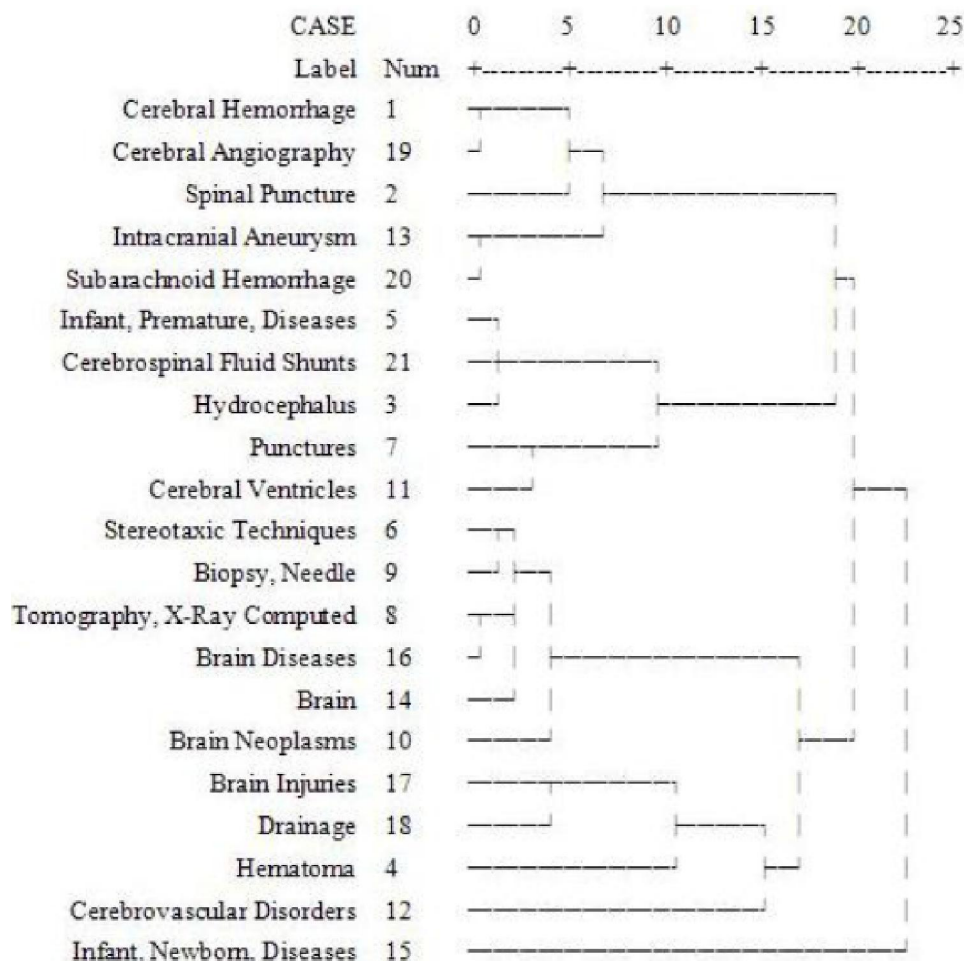


Figure 1 : Hierarchical clustering analysis dendrogram of MeSH

TABLE 2 : The top 12 MeSH terms pair

| Ranking | MeSH terms A | MeSH terms B | Occurrences frequency (times) |
|---------|------------------------|-----------------------------|-------------------------------|
| 1 | Cerebral Hemorrhage | Spinal Puncture | 42 |
| 2 | Cerebral Hemorrhage | Hydrocephalus | 22 |
| 3 | Cerebral Hemorrhage | Hematoma | 21 |
| 4 | Spinal Puncture | Hydrocephalus | 18 |
| 5 | Cerebral Hemorrhage | Infant, Premature, Diseases | 13 |
| 6 | Hydrocephalus | Infant, Premature, Diseases | 12 |
| 7 | Cerebral Hemorrhage | Stereotaxic Techniques | 11 |
| 8 | Cerebral Hemorrhage | Cerebral Ventricles | 11 |
| 9 | Cerebral Hemorrhage | Punctures | 9 |
| 10 | Spinal Puncture | Infant, Premature, Diseases | 8 |
| 11 | Stereotaxic Techniques | Biopsy, Needle | 8 |
| 12 | Cerebral Hemorrhage | Intracranial Aneurysm | 7 |

MeSH terms pair (see Figure 2). Especially the first MeSH terms pair of Cerebral Hemorrhage and Spinal Puncture appeared 42times in the same paper, it was

far higher than that of the second MeSH terms pair (22 times, Cerebral Hemorrhage and Hydrocephalus). In Figure 2 the edge represents the concurrence rela-

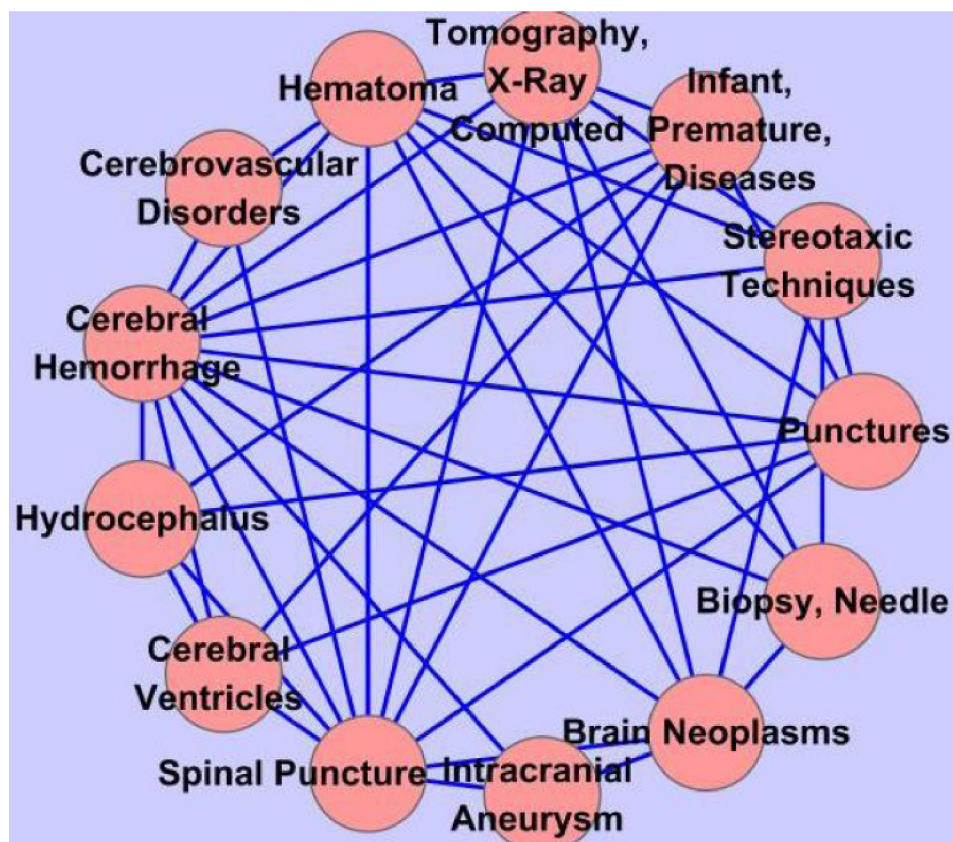


Figure 2 : Co-word network graph of the high frequency MeSH terms pair

relationship between MeSH terms pair and if the edge between one MeSH term to other MeSH term, it suggests that the one MeSH term is more important, it is in the center of the research hotspots. So we could infer that Spinal Puncture is the research hotspots of ICH puncture-draining now.

CONCLUDING REMARKS

By analyzing MeSH terms (word frequency analysis, clustering analysis, co-word network graph) of PubMed papers about ICH puncture-draining, we could infer that the current research hotspots had focus on Spinal Puncture and Hematoma, Stereotaxic Techniques, Punctures, etc, also the most importance of which was the Spinal Puncture.

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