The research hotspots analysis of relevant anatomy on maxillary sinus by PubMed

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ABSTRACT

Objective: To understand the research hotspots of relevant anatomy on maxillary sinus by PubMed. Methods: 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 current relevant anatomy research hotspots on maxillary sinus have focus on Maxilla, Ethmoid Sinus, Alveolar Ridge Augmentation, Nasal Mucosa, etc, also the most importance of which is the Maxilla. Conclusion: It is helpful and timesaving for researcher or doctor to understand the research hotspots in relevant anatomy on maxillary sinus.
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KEYWORDS

Maxillary sinus;
Anatomy;
Word frequency analysis;
Clustering analysis;
Co-word network graph;
Maxilla.

INTRODUCTION

Etiology and treatment of maxillary sinus diseases has a close relationship to maxillary sinus anatomic structure[3], such as maxillary sinusitis, maxillary sinus cyst, etc, so the relevant anatomy MeSH analysis of the maxillary sinus can be for the treatment of maxillary sinus diseases to provide ideas and methods.

Therefore this research retrieved the maxillary sinus papers of PubMed (http://www.ncbi.nlm.nih.gov/pubmed), got 8083 papers, and analyzed MeSH of above papers using Co-word Analysis[5].

MATERIALS AND METHODS

First, we retrieved PubMed papers with publica-tion dates between 1966 and 2 February 2013. Second, search terms was "maxillary sinus"[MeSH Terms] OR "maxillary antrum"[Text Word]. Third, 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. Fourth, the statistical analysis: we made MeSH term's clustering analysis using SPSS13.0 statistical software, draw the co-word network graph of the high frequency terms using Cytoscape software[4].

THE MESH TERMS ANALYSIS OF PAPERS ABOUT MAXILLARY SINUS ANATOMY

FULL PAPER

The MeSH terms word frequency analysis

We retrieved 8083 papers, among them we got 7990 papers with MeSH terms, we extracted MeSH terms and established the MeSH terms database. We got 22 MeSH terms of relevant anatomy which occurrences frequency was over 60 (including 60). From TABLE 1, we can infered some ideas:the relevant anatomy research of maxillary sinus hotspots mainly concentrated in the Maxilla, Ethmoid Sinus, Alveolar Ridge Augmentation, Nasal Mucosa, etc, it also suggests that Maxilla has become most major anatomy research hotspots on maxillary sinus.

TABLE 1 : The top 22 MeSH terms about maxillary sinus anatomy

Ranking	MeSH terms	Occurrences Frequency (times)
1	Maxilla	864
2	Ethmoid Sinus	534
3	Alveolar Ridge Augmentation	505
4	Nasal Mucosa	320
5	Frontal Sinus	304
6	Nasal Cavity	257
7	Paranasal Sinuses	243
8	Sphenoid Sinus	210
9	Alveolar Process	188
10	Nose	184
11	Nasal Septum	132
12	Tooth Root	131
13	Mandible	126
14	Palate	101
15	Turbinates	100
16	Sphenoid Bone	91
17	Ethmoid Bone	87
18	Skull	87
19	Bicuspid	83
20	Zygoma	79
21	Mouth Mucosa	65
22	Facial Bones	60

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 17 MeSH terms, drew a dendrogram, and the results were shown in Figure 1.
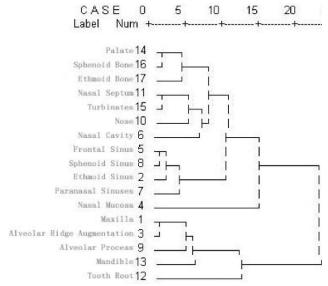

Figure 1 : Hierarchical clustering analysis dendrogram of MeSH terms

From the Figure 1, in addition to individual MeSH term as " Nasal Mucosa; Tooth Root;", we could seen the other high frequency MeSH terms could be divided into the following four groups. Group 1 contains MeSH terms (Palate; Sphenoid Bone; Ethmoid Bone), it suggests that Maxillary sinus diseases and the diseases of Palate, Sphenoid Bone, Ethmoid Bone are easy to occur at the same time[1,2]. Group 2 contains MeSH terms (Nasal Septum; Turbinates; Nose; Nasal Cavity), it suggests that Anatomically the center of Nasal Septum, Turbinates, Nose and Nasal Cavity is nose. Group 3

TABLE 2 : The top 7 MeSH terms pair

Ranking	MeSH terms A	MeSH terms B	Co-word occurrences Frequency (times)
1	Maxilla	Alveolar Ridge Augmentation	346
2	Ethmoid Sinus	Frontal Sinus	144
3	Ethmoid Sinus	Sphenoid Sinus	117
4	Maxilla	Alveolar Process	97
5	Frontal Sinus	Sphenoid Sinus	87
6	Ethmoid Sinus	Paranasal Sinuses	84
7	Frontal Sinus	Paranasal Sinuses	73

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contains MeSH terms (Frontal Sinus; Sphenoid Sinus; Ethmoid Sinus; Paranasal Sinuses), it suggests that Anatomically sinuses include maxillary sinus, ethmoid sinus and frontal sinus and sphenoid sinus. Group 4 contains MeSH terms (Maxilla; Alveolar Ridge Augmentation; Alveolar Process; Mandible), it suggests that Anatomically the center of Maxilla; Alveolar Ridge Augmentation; Alveolar Process; Mandible is tooth.

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 17 (word frequency), we got the top 7 MeSH terms pair (A and B, see TABLE 2) and co-word network graph of the MeSH terms pair (see Figure 2). Especially the first MeSH terms pair of Maxilla and Alveolar Ridge Augmentation appeared 346 times in the same paper, it was far higher than that of the second MeSH terms pair (144 times, Ethmoid Sinus and Frontal Sinus).
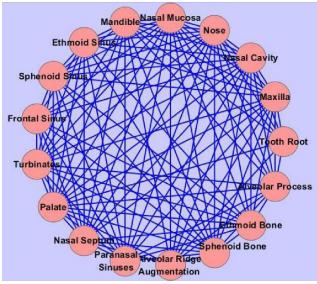

Figure 2 : Co-word network graph of the high frequency MeSH terms pair

CONCLUDING REMARKS

By analyzing MeSH terms (word frequency analysis, clustering analysis, co-word network graph) of

PubMed papers about maxillary sinus, we could infer that the current relevant anatomy research hotspots on Maxillary sinus had focus on Maxilla, Ethmoid Sinus, Alveolar Ridge Augmentation, Nasal Mucosa, etc, also the most importance of which was the Maxilla.

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