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Orofacial Manifestations of Lyme Disease: A Systematic Review

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Purpose

To identify the frequencies of orofacial manifestations documented in the U.S. population of Lyme disease

Lyme Disease

- Most common vector-borne disease in the U.S.
- First recognized in the 1970s
- Caused by a bite from an infected *Ixodes scapularis*, commonly known as a deer tick or blacklegged tick, carrying the bacterium *Borrelia burgdorferi*
- The bacterium is transferred to human hosts through a blood meal of an infected tick

Methods

Four electronic databases were systematically searched by the university's health and life sciences librarian from May 2019 to October 2019.

Several search term alterations were used and synonyms for the key search terms were cross-checked using the U.S. National Library of Medicine Unified Medical Language System.

Retrieved articles were independently reviewed for relevance based on titles and abstracts.

Risk of bias was assessed independently, and data extraction was completed using a modified version of the Cochrane Data Collection Form for Randomized Control Trials and Non-randomized Control Trials.

Meetings were held to resolve disagreements by consensus.

Methods Cont.

Inclusion Criteria:

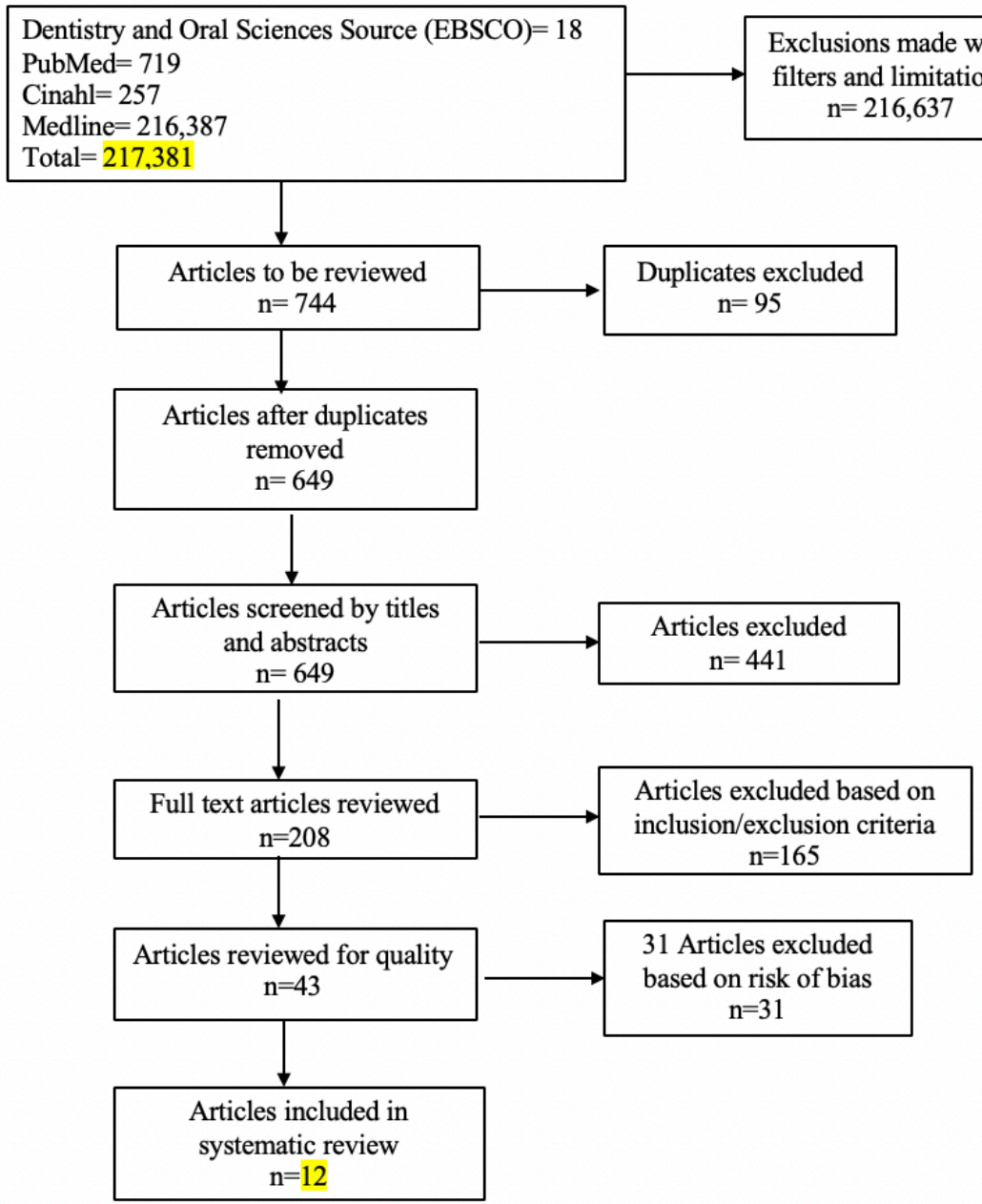
- Studies that included populations from the U.S.
- Available in full-text and in the English language
- Confirmed CDC diagnosis of Lyme disease

Exclusion Criteria:

- Studies of foreign populations
- Studies involving animal subjects
- Tick-borne diseases other than Lyme disease
- Studies that did not confirm a Lyme disease diagnosis

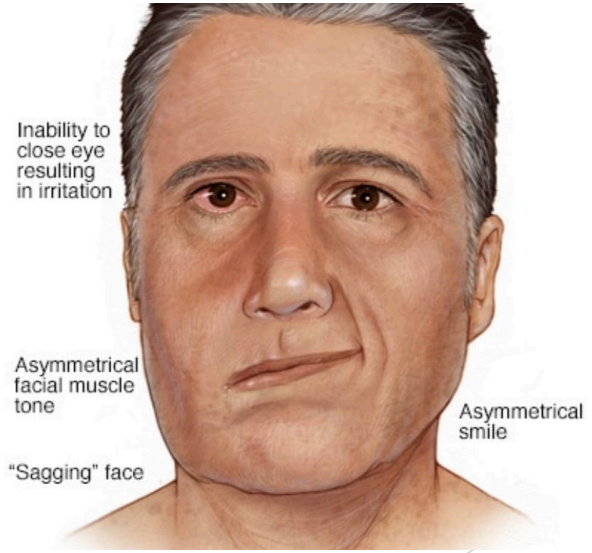
Results

PRISMA Flowchart of article retrieval and study selection

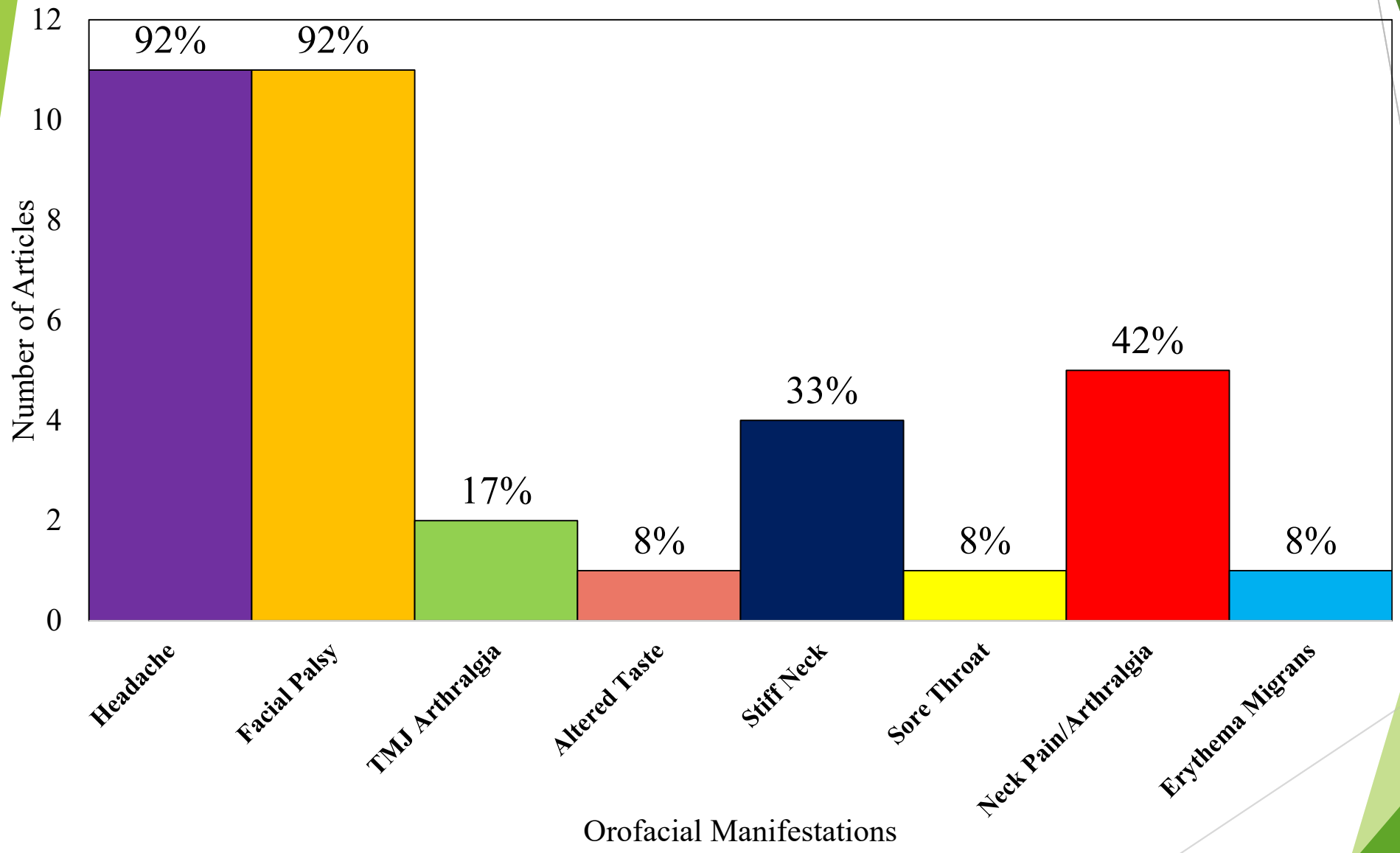


Orofacial Manifestations

- Headache
- Facial palsy
- Temporomandibular joint (TMJ) arthralgia
- Altered taste
- Stiff neck
- Sore throat
- Neck pain/arthralgia
- Erythema migrans rash on the head or neck

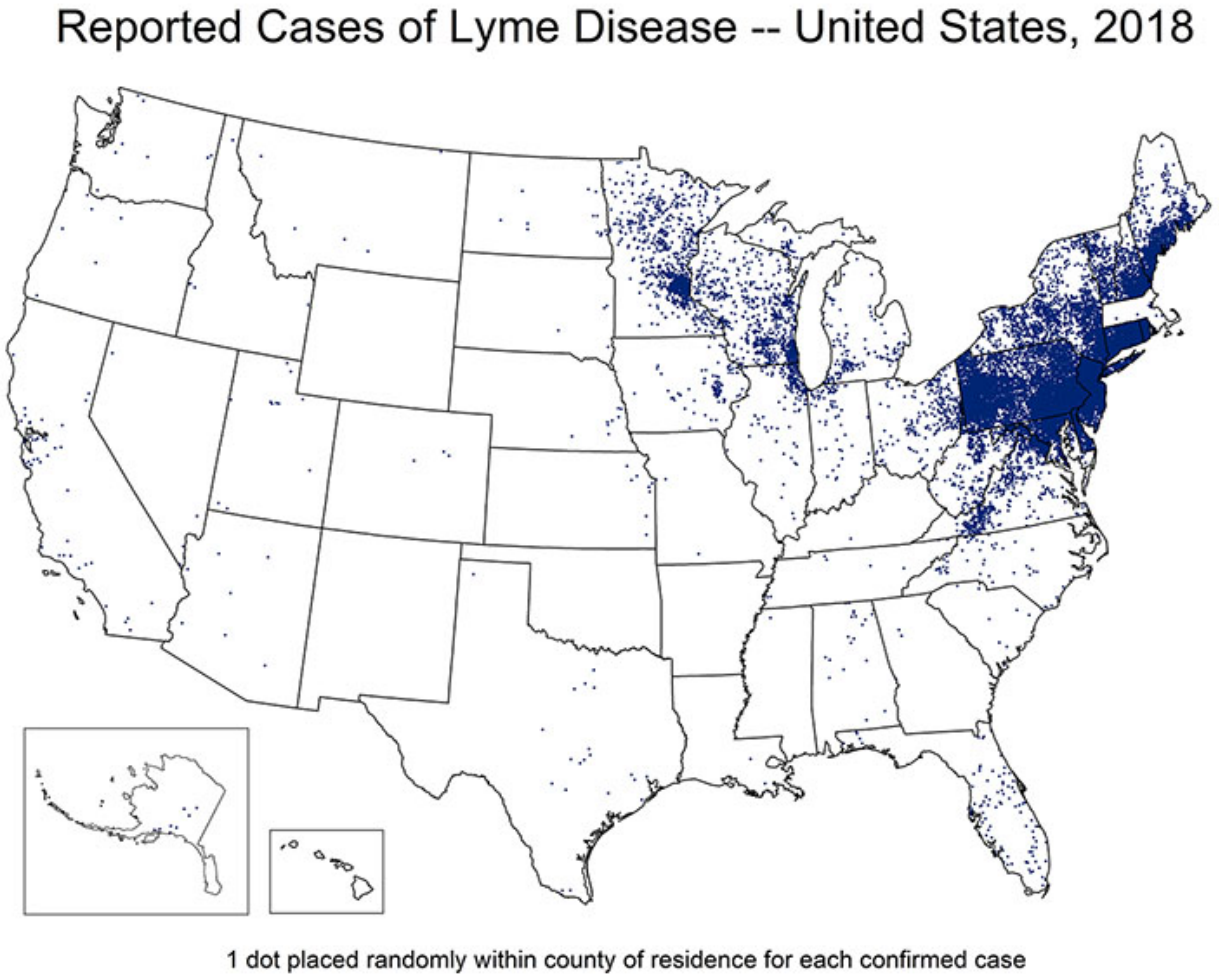


Orofacial Manifestations Reported In The Articles



Results Cont.

Results Cont.



Endemic states where Lyme disease was reported in patients

- Delaware (n=3, 25%)
- Massachusetts (n=4, 33%)
- Pennsylvania (n=2, 17%)
- New Jersey (n=1, 8%)
- Connecticut (n=3, 25%)
- New York (n=5, 42%)

Results Cont.

TYPE OF STUDY	NUMBER OF STUDIES	PERCENTAGE
Retrospective	6	50%
Prospective	1	8%
Observational design	5	42%

Results Cont.

In half of the articles (n=6, 50%), the frequency of orofacial manifestations appeared more than the total number of patients with confirmed Lyme disease.

In one article they appeared the same number of times (n=1, 8%).

In five articles they appeared only slightly less (n=5, 42%).

Results Cont.

- Nine out of the twelve articles (75%), included mostly males while only two articles reported predominantly on female populations. One article did not make the distinction clear.

- Six articles included a mixture of ages from childhood to adulthood (n=6, 50%), four included children and adolescents (n=4, 33%),and one focused only on adults (n=1, 8%).

Discussion

- New research is needed in order to have a better understanding of this topic.
- None of the included articles discussed assessments or scales that could be used to quantify orofacial manifestations.
- None of the included articles came from journals whose target audience is in the dental profession.

Discussion Cont.

Less than half (6 out of 14) of the endemic states were represented by the articles.

The literature also did not report orofacial manifestations evenly across demographics.

An underrepresentation of females could be a concern especially for those residing in low incidence states since Lyme disease has been found to be more common among females there.

Since half of the articles reported more orofacial manifestations than the total number of research participants, orofacial manifestations should be highly considered in clinical diagnoses, especially since they can occur during the localized early stage when serology testing may fail.

Conclusion

Current research regarding the orofacial manifestations of Lyme disease is needed so that the medical phenomenon can be well understood by healthcare professionals in order to best serve their patients.

Acknowledgments

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