LEWIS KATZ SCHOOL OF MEDICINE

Proposed Diagnostic and Classification of Lemierre's syndrome

Johnson Liu[1] and Ho-Man Yeung[2]
1. Lewis Katz School of Medicine at Temple University, Philadelphia, USA.
2. Department of Medicine, Section in Hospital Medicine, Lewis Katz School of Medicine at Temple University, Philadelphia, USA.

Introduction

- Lemierre's syndrome (LS) is typically comprised of constellation of oropharyngeal infection, septic thrombophlebitis of the internal jugular vein (IJV), and distant metastatic infections (ie. septic emboli and cavitary lesions)[1].
- Without concrete diagnostic criteria, conditions such as "Lemierre's-like" and "Lemierre's-variant" appear in the literature[2,3]. This variability makes LS an ambiguous and inconsistent diagnosis.
- **Objective:** To sort the variability within the literature of LS and propose a novel diagnostic framework for categorizing different presentation of "Lemierre's syndrome"

Methods

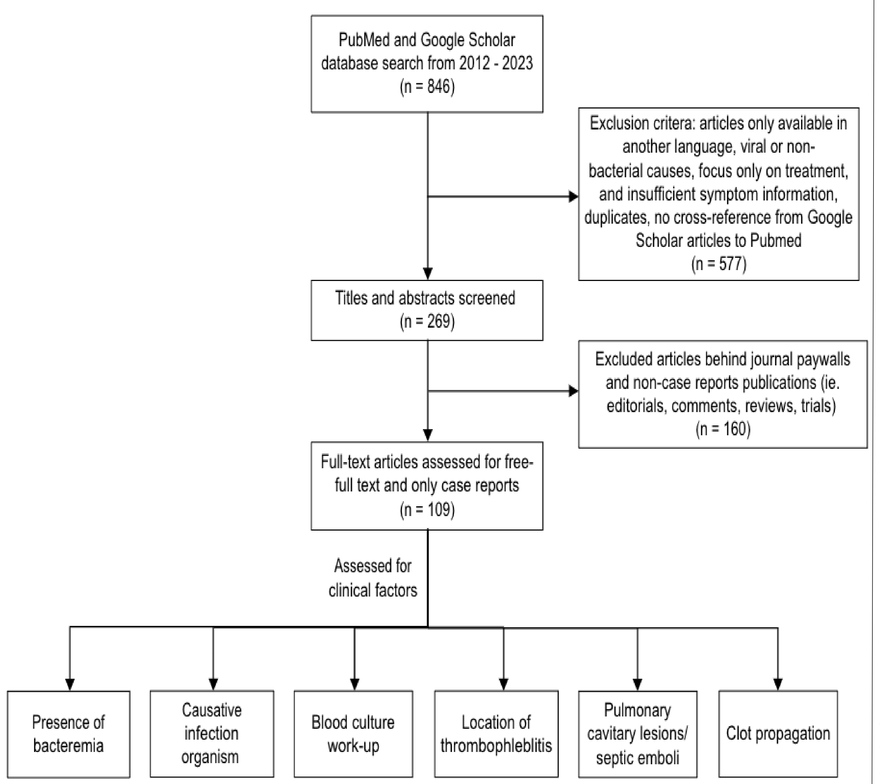

Figure 1. Screening process flowchart for LS cases from January 2012 to December 2023 based on PubMed and Google Scholar database search and clinical factors screened

Results

Of 109 reported cases, only 89 (81.7%) revealed bacteremia, 48 (44%) caused by Fusobacter sp., 77 (70.6%) with pulmonary septic emboli or cavitary lesion, while 81 (74.3%) patients had oropharyngeal infection and 28 (25.7%) patients had SSTI.

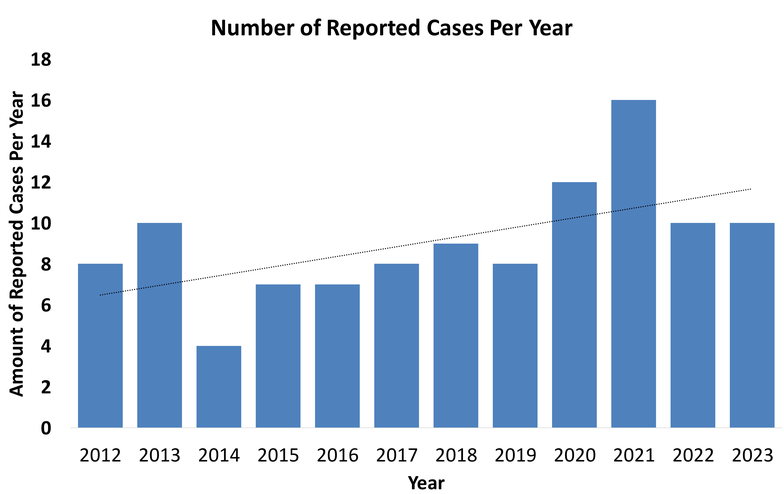

Figure 2. Combined bar graph and line chart for Lemierre's syndrome case reports from January 2012 to December 2023 based on PubMed and Google Scholar database search
The number of cases from 2019-2023 accounted for a majority of reported LS (51.4%, n = 56), with majority of cases reported in 2021 (n = 16).

Lemierre's type	Number (n)	Percentage (%) IJV thrombus	Percentage (%) pulmonary septic emboli	Percentage (%) clot propagation
Type I	51	100 (n = 51)	78.4 (n = 40)	29.4 (n = 15)
Type II	13	100 (n = 13)	53.8 (n = 7)	53.8 (n = 7)
Type III	3	100 (n = 3)	100 (n = 3)	33.3 (n = 1)
Type IV/ Lemierre's variant	24	0 (n = 0)	70.8 (n = 17)	41.7 (n = 10)
Presumed Lemierre's	18	100 (n = 18)	55.6 (n = 10)	22.2 (n = 4)
Total	109	78 (n = 85)	70.6 (n = 77)	33.9 (n = 37)

Table 1. Percentage of clinical factors of Lemierre's syndrome subtypes
Type I constituted most of the total cases (46.8%, n – 51). Patients who had Type IV/ Lemierre's variant (0%, n = 24) were found to have no presence of IJV thrombus compared to all other subtypes (Type I: 100%, n = 51; Type II: 100%, n = 13; Type III: 100%, n = 3; Presumed: 100%, n = 18) and total cases (78%, n = 85). The presence of clot propagation (33.9%, n = 37) was not a defining characteristic among all LS subtype when compared to other clinical factors such as IJV thrombus and pulmonary septic emboli.

Results (continued)

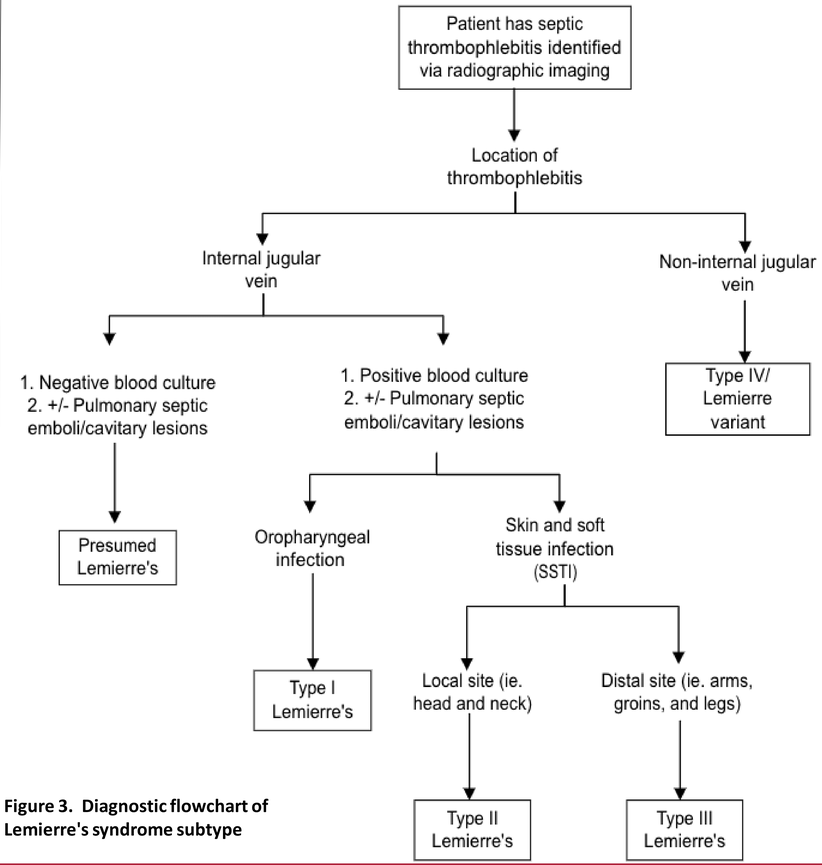

Figure 3. Diagnostic flowchart of Lemierre's syndrome subtype

Conclusions

Using our diagnostic model, we were able to categorize 109 reported cases of LS between 2012 and 2023 into distinct diagnostic patterns which would reduce diagnostic variability and inconsistency. We expanded traditional thinking about LS to include SSTI.

Proposed Definition

Lemierre's syndrome (type I): Bacteremia + IJ thrombophlebitis + oropharyngeal infection
Lemierre's syndrome (type II): Bacteremia + IJ thrombophlebitis + local SSTI
Lemierre's syndrome (type III): Bacteremia + IJ thrombophlebitis + distal SSTI
Lemierre's syndrome-variant (type IV): Bacteremia + non-IJ thrombophlebitis + SSTI
Presumed Lemierre's syndrome: IJ thrombophlebitis + oropharyngeal/SSTI without known bacteremia

References

1. Allen BW, Anjum F, Bentley TP. Lemierre Syndrome. [Updated 2023 Jul 31]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-.
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3. Tsai YJ, Lin YC, Harnnd DJ, Chiang RP, Wu HM. A Lemierre syndrome variant caused by Klebsiella pneumoniae. J Formos Med Assoc. 2012 Jul;111(7):403-5. doi: 10.1016/j.jfma.2012.03.012. Epub 2012 Apr 8. PMID: 22817819.