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Edit Evaluation of Blood Culture Submission Rates in Japan

Description of J-SIPHE is here !!

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Background

- Blood culture tests are essential for instituting antimicrobial resistance (AMR) countermeasures.
- Appropriate indicators are being investigated by the Clinical & Laboratory Standards Institute (CLSI). However, due to differences in the health care systems in each country, such indicators may vary from country to country.
- This study investigated blood culture submission rates in Japan, as well as their association with the incidence of bloodstream infections.

Methods

- Data recorded in the Japan Surveillance for Infection Prevention and Healthcare Epidemiology (J-SIPHE) from 2019 was used.
- One submission was defined as one set of blood culture samples (aerobic and anaerobic bottles) .
- The incidence of bloodstream infections was calculated **as the number of positive blood cultures excluding contaminated specimens per 1000 patients/day**.
- The blood culture submission rate was calculated **as the number of submitted blood cultures per 1000 patients/day. Then divided into 4 categories**.
- The Kruskal-Wallis test was performed to determine overall difference among 4 categories and **the Dunn test with Bonferroni correction was used to compare pairs of submission rate categories**.

Results

- 117 hospitals were included.
- The median incidence of bloodstream infection by category of blood culture submission rate was **1.39, 2.53, 3.61**, and **4.48**, respectively.
- Significant differences were observed between categories 1 and 2, and between categories 2 and 3 (p< 0.01, respectively); **a significant difference was not observed between categories 3 and 4.** (p=0.758).

Features of the facilities by category

Blood culture submission rate*	N	Number of beds	Length of stay
1): [0, 15)	19	271(173-499)	13.5(7.0-17.3)
2): [15, 30)	50	345.5(120-1207)	12.4(7.3-18.9)
3): [30, 45)	33	500(135-1080)	11.4(7.1-18.2)
4): [45, 80)	15	568(281-885)	11.6(8.8-15.2)

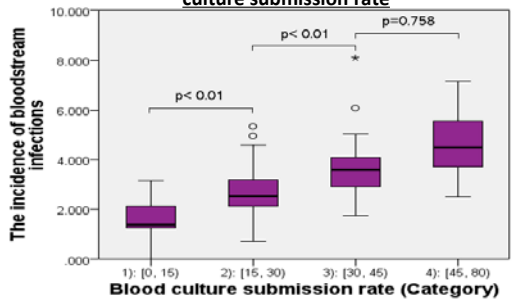
* The number of submitted blood cultures per 1000 patients/day

Conclusion

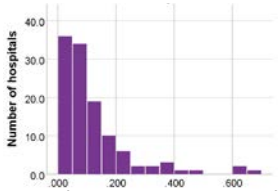
- **The appropriate blood culture submission rate is considered to be around 45** in the acute hospital setting in Japan.
- And the incidence of bloodstream infections is greatly affected by submission rates.
- We need to find a benchmark for the evaluation of blood cultures in Japan.

Figure

Incidence of bloodstream infections by category of blood culture submission rate

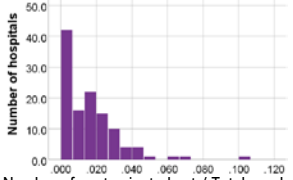


The solitary blood culture rate



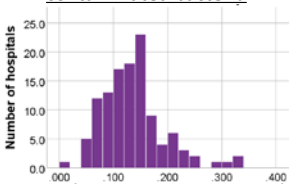
= Number of solitary set / Total number of submitted set

Blood culture contamination rate



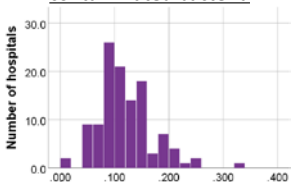
= Number of contaminated set / Total number of submitted set

Positive blood culture rate including contaminated bacteria



= Number of positive set / Total number of submitted set

Positive blood culture rate excluding contaminated bacteria



= (Number of positive set - Number of contaminated positive set) / Total number of submitted set

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