Pneumonia

- Prevalence and antibiotic resistance of pathogens isolated from neurosurgical patients with postoperative central nervous system infections in a tertiary hospital in North China
- Idiopathic Normal-Pressure Hydrocephalus Revealed by Systemic Infection: Clinical Observations of Two Cases
- Impact of COVID-19 on specialty televisits in a large integrated health care system
- Challenges in Pulmonary Management after Traumatic Brain and Spinal Cord Injury
- Development and validation of a nomogram for predicting intracranial infection after intracranial aneurysm surgery
- Effects of Active Interferential Current Stimulation on Swallowing Function in Patients with Dysphagia: A Cross-Sectional Study of Interferential Current Stimulation on Swallowing Function in Patients with Dysphagia: A Cross-Sectional Study
- Lumbar spinal fusion in postmenopausal women with a history of hormone replacement therapy
- Subacute sclerosing panencephalitis as a re-emerging condition due to low vaccination coverage: a case-series

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Pneumonia is an inflammatory condition of the lung affecting primarily the microscopic air sacs known as alveoli.

Epidemiology

The incidence of pneumonia in ICU patients with TBI is very high, seriously affecting the prognosis. A study aimed to construct a predictive model for pneumonia in ICU patients with TBI and provide help for the prevention of TBI-related pneumonia. Clinical data of ICU patients with TBI were collected from the Medical Information Mart for Intensive Care (MIMIC)-IV database and hospital data. Variables were screened by lasso and multivariate logistic regression to construct a predictive nomogram model, verified in internal validation cohort and external validation cohort by receiver operator characteristic (ROC) curve, calibration curve and decision curve analysis (DCA).A total of 1850 ICU patients with TBI were enrolled in the study from the MIMIC-IV database, including 1298 in the training cohort and 552 in internal validation cohort. The external validation cohort included 240 ICU patients with TBI from hospital data. Nine variables were selected from the training cohort by lasso regression and multivariate logistic regression, and a pneumonia prediction nomogram was constructed. This nomogram has a high discrimination in training, internal validation and external validation cohorts (AUC = 0.857, 0.877, 0.836). The calibration curve and DCA showed that this nomogram had a high calibration and better clinical decision-making efficiency.The nomogram showed excellent discrimination and clinical utility to predict pneumonia, and could identify pneumonia high-risk patients early, thus providing precision medicine strategies for ICU patients with TBI [1)]

Etiology

It is usually caused by infection with viruses or bacteria and less commonly other microorganisms,

certain drugs, and other conditions such as autoimmune diseases.

see Klebsiella pneumoniae

Streptococcus pneumoniae.

Classification

Community-acquired pneumonia.

Hospital-acquired pneumonia.

Stroke-associated pneumonia.

Aspiration pneumonia.

Ventilator-associated pneumonia.

Risk factors

Risks of general anesthesia include: heart attack, stroke, pneumonia.

Decreased peak expiratory flow may predict pneumonia development in older adults [2].

The routine use of sedatives and paralytics in neurotrauma patients may lead to a higher incidence of pneumonia, longer ICU stays, and possibly sepsis [3].

Early tracheostomy reduces the number of days of mechanical ventilation but does not affect mortality or incidence of pneumonia [4].

Patients with cervical SCIs are more prone to pneumonia due to the fact that most of the effort in a normal cough originates in the abdominal muscles which are paralyzed.

Whereas bringing gastric pH to a more neutral level reduces the risk of stress ulcer, pH > 4 permits bacterial colonization of the normally sterile stomach. This may increase the risk of pneumonia from aspiration, and there is a suggestion that mortality may also be increased.

Sucralfate may be as effective in reducing bleeding, but may be associated with lower rates of

pneumonia and mortality. There is insufficient data to determine the net result of sucralfate compared to no treatment [5].

IV drip Ranitidine (provides a more consistently higher pH without peaks and troughs; some controversy that this may increase gastric bacterial concentration with increased risk of aspiration pneumonia has not been borne out): 6.25 mg/hr (e.g. inject 150 mg into 42 ml of IVF yielding 3.125 mg/ml, run at 2ml.

Clinical features

Typical signs and symptoms include a cough, chest pain, fever, and difficulty breathing.

Diagnostic tools include x-rays and culture of the sputum. Vaccines to prevent certain types of pneumonia are available. Treatment depends on the underlying cause. Pneumonia presumed to be bacterial is treated with antibiotics. If the pneumonia is severe, the affected person is generally hospitalized.

Pneumonia affects approximately 450 million people globally per year (7% of the population) and results in about 4 million deaths. Although pneumonia was regarded by William Osler in the 19th century as “the captain of the men of death,” the advent of antibiotic therapy and vaccines in the 20th century has seen improvements in survival.

Nevertheless, in developing countries, and among the very old, the very young, and the chronically ill, pneumonia remains a leading cause of death.

In the terminally ill and elderly, especially those with other conditions, pneumonia is often the immediate cause of death. In such cases, particularly when it cuts short the suffering associated with lingering illness, pneumonia has often been called “the old man's friend.”

Outcome

The incidence of pneumonia in ICU patients with TBI is very high, seriously affecting the prognosis. A study aimed to construct a predictive model for pneumonia in ICU patients with TBI and provide help for the prevention of TBI-related pneumonia. Clinical data of ICU patients with TBI were collected from the Medical Information Mart for Intensive Care (MIMIC)-IV database and hospital data. Variables were screened by lasso and multivariate logistic regression to construct a predictive nomogram model, verified in internal validation cohort and external validation cohort by receiver operator characteristic (ROC) curve, calibration curve and decision curve analysis (DCA).A total of 1850 ICU patients with TBI were enrolled in the study from the MIMIC-IV database, including 1298 in the training cohort and 552 in internal validation cohort. The external validation cohort included 240 ICU patients with TBI from hospital data. Nine variables were selected from the training cohort by lasso regression and multivariate logistic regression, and a pneumonia prediction nomogram was constructed. This nomogram has a high discrimination in training, internal validation and external validation cohorts (AUC = 0.857, 0.877, 0.836). The calibration curve and DCA showed that this nomogram had a high calibration and better clinical decision-making efficiency.The nomogram showed excellent discrimination and clinical utility to predict pneumonia, and could identify pneumonia high-risk patients early, thus providing precision medicine strategies for ICU patients with TBI [6]

Complications

SIADH

Spinal epidural abscess

Subdural empyema.

References

[1] , [6]
Geng X, Wu H, Liu C, Qi L, Ballah AK, Che W, Wu S, Fu T, Li N, Wei X, Cheng R, Pang Z, Ji H, Wang Y, Wang X. Construction and validation of a predictive model of pneumonia for ICU patients with traumatic brain injury (TBI). Neurosurg Rev. 2023 Nov 21;46(1):308. doi: 10.1007/s10143-023-02208-9. PMID: 37985473.

[2]
Kamimura T, Nakamori M, Naito H, Aoki S, Nezu T, Imamura E, Mizoue T, Wakabayashi S, Masuda T, Hattori N, Maruyama H, Hosomi N. Peak expiratory flow, but not tongue pressure, can predict pneumonia development in older adults. Eur Geriatr Med. 2023 Jan 14. doi: 10.1007/s41999-023-00744-7. Epub ahead of print. PMID: 36640229.

[3]
The Brain Trauma Foundation. The American Association of Neurological Surgeons. The Joint Section on Neurotrauma and Critical Care. Initial management. JNeurotrauma. 2000; 17:463–469

[4]
Brain Trauma Foundation, Povlishock JT, Bullock MR. Infection prophylaxis. J Neurotrauma. 2007; 24:S26–S31

[5]
Cook DJ, Reeve BK, Guyatt GH, et al. Stress Ulcer Prophylaxis in Critically Ill Patients: Resolving Discordant Meta-Analyses. JAMA. 1996; 275:308–314