

Documents

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Target association rule mining to explore novel paediatric illness patterns in emergency settings
(2022) *Scandinavian Journal of Clinical and Laboratory Investigation*, 82 (7-8), pp. 595-600. Cited 4 times.

DOI: 10.1080/00365513.2022.2148121

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Abstract

Background and aims: To assess the hospitalized sick children admitted to the pediatric emergency department (ED) and to find new patterns of clinical and laboratory attributes using association rule mining (ARM). **Methods:** In this observational study, 158 children with median (IQR) age 11 months and a PRISM III score of 5 (2–9) were enrolled. Hotspot data mining method was applied to assess clinical attributes, lab investigations and pre-defined outcome parameters of children and their association in sick hospitalized children aged 1 month to 12 years. **Results:** We obtained 30 rules with value for outcome as discharge is given attributes as follows: duration of hospitalization > 4 days, lactate > 1.2 mmol/L, platelet = 3.67/μL, dur_ventil = 0 h, serum K = 5.2 mmol/L, SBP = 120 mmHg, pCO₂ = 41.9 mmHg, PaO₂ = 163 mmHg, age = 92 months, heart rate > 114–159 per minute, temperature > 98 °F, GCS (Glasgow Coma Scale) > 7–14, gas K = 4.14 mmol/L, gas Na = 138.1 mmol/L, BUN (Blood Urea Nitrogen) = 18.69 mg/dL, Diagnosis > 1–718, Creatinine = 1.2 mg/dL, serum Na = 148 mmol/L, shock = 2, Glucose = 144 mg/dL, Mg(i) > 0.23 meq/L, BUN > 6.54 mg/dL. **Conclusion:** ARM is an effective data analysis technique to find meaningful patterns using clinical features with actual numbers in pediatric critical illness. It can prove to be important while analysing the association of clinical attributes with disease pattern, its features, and therapeutic or intervention success patterns. © 2022 Medisinsk Fysiologisk Forenings Forlag (MFFF).

Author Keywords

artificial intelligence; Association rule mining (ARM); children; clinical attributes; pediatric illness pattern

Index Keywords

creatinine, glucose, lactic acid, magnesium ion, potassium, sodium, urea, glucose, potassium, sodium; age, algorithm, arterial gas, arterial oxygen tension, Article, artificial ventilation, association rule mining, blood gas analysis, body temperature, carbon dioxide tension, childhood disease, clinical feature, critical illness, critically ill patient, data analysis, data mining, disease course, emergency patient, emergency ward, exploratory research, female, Glasgow coma scale, heart rate, hospital admission, hospital discharge, hospitalized child, human, infant, laboratory test, length of stay, major clinical study, male, mortality risk score, observational study, outcome assessment, pediatric emergency medicine, pediatric patient, Pediatric risk of mortality III score, platelet count, potassium blood level, shock, sodium blood level, systolic blood pressure, urea blood level, urea nitrogen blood level, child, hospital emergency service; Blood Urea Nitrogen, Child, Emergency Service, Hospital, Glucose, Humans, Potassium, Sodium

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Publisher: Taylor and Francis Ltd.

ISSN: 00365513
CODEN: SJCLA
PubMed ID: 36399102
Language of Original Document: English
Abbreviated Source Title: Scand. J. Clin. Lab. Invest.
2-s2.0-85142255522
Document Type: Article
Publication Stage: Final
Source: Scopus

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