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Digital Toxicology Teleconsultation for Adult Poisoning Cases in Saudi Hospitals: A Nationwide Study

Background

Poisoning represents a significant global public health challenge, particularly with its complex manifestations in adult populations. This nationwide study analyzes hospital-based toxicology teleconsultation data from the Toxicology Consultation Service-Saudi Medical Appointments and Referrals Center to characterize the epidemiological patterns, clinical features, and outcomes of adult poisoning cases across Saudi regions.

Methods

We conducted a retrospective cross-sectional analysis of 6427 adult poisoning cases where hospitals sought teleconsultation from the Saudi Toxicology Consultation Service from January to December 2023. Descriptive statistics were used to analyze poisoning rates by demographic characteristics, agents responsible for the poisoning, clinical presentations, and management decisions. Population-adjusted rates were calculated using the national census data. Associations between variables were analyzed using cross-tabulations and chi-square tests.

Results

Young adults aged 18-35 years constituted most cases (58.67%), with the highest population-adjusted rates observed among those aged 18-24 (5.15 per 10,000). Medicine-related poisonings were the most common across all regions (50.04%), followed by bites and stings (15.31%). Regional analysis indicated relatively uniform poisoning rates across Business Units (BUs) (2.02-2.74 per 10,000). Most cases (87.44%) were asymptomatic, with 91.71% exhibiting normal Glasgow Coma Scale scores, although substance abuse cases had higher rate of severe manifestations (24.34%). Significant seasonal variations were observed ($p < 0.001$), with peak incidents occurring in the summer (29.25%). Management decisions primarily involved hospital observation (40.27%) and admission (30.34%), with agent-specific variations in care requirements ($p < 0.001$).

Conclusions

This comprehensive analysis demonstrates the effectiveness of Saudi Arabia's digital infrastructure in capturing and managing nationwide poisoning data. Our findings inform evidence-based recommendations for targeted prevention strategies, particularly for young adults and medicine-related poisonings, while establishing a scalable model for digital health-enabled poisoning management.

Keywords: Saudi Arabia; Adult Poisoning; Digital Health; Public Health; Telemedicine; Toxic Epidemiology.

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Biography

Dr. Maram Al-Otaiby is a distinguished healthcare leader and molecular genetics expert, currently serving as the CEO of Health Support Services Center at the Ministry of Health, and CEO Advisor at the Health Holding Company, renowned for establishing critical healthcare infrastructure, advancing genomic research, and driving transformative initiatives during the COVID-19 pandemic. She previously held several leadership positions at King Saud University including Associate Professor of Medicine and Consultant in Molecular Genetics. Dr. Al-Otaiby received her BSc in Genetics from the University of Arkansas, before receiving her MSc in Biotechnology and a Ph.D. in Molecular Genetics Oncology from Georgetown University.