Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/vxqh3m12

MEDICAL RISK ASSESSMENT IN PATIENTS REFERRED TO DENTAL CLINICS IN RIYADH, SAUDI ARABIA.

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Abstract
Medical risk assessment (MRA) is essential for ensuring patient safety in dental care, particularly in regions with high chronic disease prevalence like Riyadh, Saudi Arabia. This study investigates MRA practices in dental clinics, focusing on epidemiological data, standardized protocols, and risk stratification. Using a retrospective analysis of 2,500 patient records, we evaluate the prevalence of systemic conditions, MRA implementation, and associated outcomes. Results indicate that robust MRA reduces complications by 40%, though challenges like incomplete histories persist.
Evidence-based interventions, including digital integration and predictive analytics, are proposed to enhance MRA efficacy.

Introduction
Dental procedures carry inherent risks for patients with systemic comorbidities, necessitating comprehensive MRA to prevent adverse events such as hemorrhage, infection, or cardiovascular complications. In Riyadh, where non-communicable diseases (NCDs) like diabetes (24.3% prevalence) and hypertension (26%) are rampant, MRA is critical. This paper examines the scientific foundation of MRA in Riyadh's dental clinics, integrating epidemiological data, clinical protocols, and a retrospective study to assess practices and outcomes. It also addresses challenges and proposes data-driven solutions.

Materials and Methods
Study Design
A retrospective cohort study was conducted to evaluate MRA practices in five major dental clinics in Riyadh. Data were collected from January 2023 to March 2025.

Population and Sample
- **Inclusion Criteria**: Patients aged ≥18 years referred to dental clinics for elective procedures (e.g., extractions, restorations, implants).
- **Exclusion Criteria**: Emergency cases, incomplete medical records, or patients under 18.
- **Sample Size**: 2,500 patient records, selected via stratified random sampling to ensure representation across clinics.

Data Collection

- **Medical Records**: Extracted data included medical history (chronic diseases, medications, allergies), vital signs, laboratory results (e.g., HbA1c, INR), and ASA classification.
- **MRA Protocols**: Documented steps included history review, clinical evaluation, consultations, and treatment modifications.
- **Outcomes**: Recorded complications (e.g., bleeding, infection, cardiovascular events) and consultation rates.

Ethical Considerations

The study was approved by the Institutional Review Board (IRB) at KKUH (IRB No. 2023-045). Patient data were anonymized to ensure confidentiality.

Results

Patient Characteristics

- **Demographics**: Mean age 42.6 years (SD: 14.2); 52% male, 48% female.
- **Systemic Conditions**: 41% had at least one chronic condition (95% CI: 39.0–43.0%). Diabetes (25%), hypertension (22%), and asthma (10%) were most prevalent.
- **ASA Classification**: ASA I: 48%, ASA II: 39%, ASA III: 11%, ASA IV: 2%.

MRA Implementation

- **History Completeness**: 78% of records had complete medical histories; 22% were incomplete due to patient nondisclosure or documentation errors.
- **Consultations**: 85% of ASA III/IV patients received specialist consultations (95% CI: 80.5–89.5%).
- **Treatment Modifications**: 65% of high-risk patients had modified protocols (e.g., epinephrine-free anesthetics, antibiotic prophylaxis).
- **Complications**: Adverse events occurred in 4.2% of cases (n=105; 95% CI: 3.4–5.0%). Bleeding (1.8%), infections (1.2%), and hypoglycemia (0.8%) were most common.
- **Risk Factors**: Incomplete MRA increased complication risk (OR: 2.7, 95% CI: 1.8–4.1, $p < 0.001$). ASA III/IV patients had higher complication rates (12.5% vs. 2.1% for ASA I/II, $p < 0.01$).
- **Impact of MRA**: Complete MRA reduced complications by 40% (OR: 0.60, 95% CI: 0.45–0.80, $p < 0.001$).
- **Consultation Effect**: Pre-treatment consultations lowered emergency referrals by 30% (OR: 0.70, 95% CI: 0.52–0.94, $p = 0.02$).

Clinic-Specific Findings

- King Faisal Specialist Hospital & Research Centre reported the lowest complication rate (2.0%, $p < 0.001$), attributed to integrated EHRs and predictive analytics.
- Smaller clinics had higher rates of incomplete histories (30% vs. 15% in tertiary centers, $p < 0.01$).

Discussion

Epidemiological Context

The high prevalence of NCDs in Riyadh (41% with chronic conditions) aligns with national data (Saudi Health Interview Survey, 2023). Diabetes and hypertension, major risk factors, increase complications like delayed healing (OR: 2.8; Al-Khabbaz et al., 2021) and cardiovascular events (RR: 3.1; Al-Zahrani et al., 2020).

MRA Effectiveness

The 40% reduction in complications with complete MRA underscores its protective role. The ASA classification effectively stratified risk, with ASA III/IV patients showing significantly higher

complication rates ($p < 0.01$). Consultations mitigated risks, particularly for coagulopathies (OR: 0.70).

Challenges

Incomplete histories (22%) were a significant barrier, consistent with cultural reluctance to disclose conditions (OR: 2.3; Al-Ansari et al., 2023). Resource disparities, with only 60% of clinics using EHRs, hindered standardization.

Proposed Interventions

- **EHR Integration**: Universal EHR adoption could reduce errors by 50% (Al-Zahrani et al., 2020).
- **Predictive Analytics**: Machine learning models (85% accuracy; Al-Mubarak et al., 2019) can enhance risk stratification.
- **Training**: Simulation-based programs improve competency by 40% (SCFHS, 2023).
- **Patient Education**: Campaigns to improve disclosure could increase reporting by 20%.

Conclusion

MRA is a scientifically validated process critical for safe dental care in Riyadh's high-risk population. This study demonstrates that thorough MRA reduces complications by 40%, with consultations and modified protocols enhancing outcomes. However, incomplete histories and resource limitations require urgent action. Implementing EHRs, predictive analytics, and targeted training can position Riyadh's dental clinics as global leaders in managing medically compromised patients.

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