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Assessment of legibility and completeness of handwritten and electronic prescriptions

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Objectives: To assess the legibility and completeness of handwritten prescriptions and compare with electronic prescription system for medication errors.

Design: Prospective study

Setting: King Khalid University Hospital (KKUH), Riyadh, KSA.

Subjects & Methods: Handwritten prescriptions were received from clinical units of Medicine Outpatient Department (MOPD), Primary Care Clinic (PCC) and Surgery Outpatient Department (SOPD) whereas electronic prescriptions were collected from the pediatric ward. The handwritten prescription was assessed for completeness by the checklist designed according to the hospital prescription and evaluated for legibility by two pharmacists. The comparison between hand written and electronic prescription errors was evaluated based on the validated checklist adopted from previous studies.

Main Outcome Measures: Legibility and completeness of prescriptions

Results: 398 prescriptions (199 handwritten and 199 e-prescriptions) were assessed. About 71 (35.7%) of handwritten and 5 (2.5%) of electronic prescription errors were identified. A significant statistical differences ($p < 0.001$) was observed between hand written and e-prescriptions in omitted dose and omitted route of administration category of error distribution. The rate of completeness in patient identification in handwritten prescriptions was 80.97% in MOPD, 76.36% in PCC and 85.93% in SOPD clinic units. Assessment of medication prescription completeness was 91.48% in MOPD, 88.48% in PCC, and 89.28% in SOPD.

Conclusions: This study revealed high incidence of prescribing errors in handwritten prescriptions. The use of e-prescription system showed significant decline in the incidence of errors. The legibility of handwritten prescriptions was relatively good whereas the level of completeness was very low.

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Cancer hallmarks and multiscale simulation in medicine

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The original list of hallmarks includes self-sufficiency in growth signals, insensitivity to anti-growth signals, evading apoptosis, limitless replicative potential, sustained angiogenesis and tissue invasion and metastasis. This list has been recently extended from 6 to 10 with few more hallmarks emerging. In this paper, we concentrate on the second one (p53/microRNA-34a network in natural and therapeutic tumor suppression setting). Solving problems in system biology requires various approaches ranging from molecular processes up to the macro-organism, thus requires special attitude to handle these problems mathematically. The problem is widely different time scales at different levels of organization from molecules to macro-organism. Oncologic diseases are typical examples. Although there is an obvious progress in knowledge and treatment, the numbers of positively diagnosed patients are growing. As the oncologic diseases do not represent a single illness but a heterogeneous class of disorders with various causality and consequences, the quest for common attributes or effective prevention and therapy is a highly complicated task. Recent empiric procedures are frequently failing and leading only to suppression of symptoms. Similarly, our knowledge on prevention is coming from epidemiological studies based on previous observations. Meta-analysis of available data can help to identify some unexpected and therefore unattended interactions. Systemic analysis using simulated experiments and subsequent experimental (wet lab) verification may serve as a tool to search for complex therapeutic procedures. Understanding of malignant processes and their modeling will open new possibilities for more exact prediction of preventive or therapeutic approaches. The simulation of cancer should be considered as additional tool in the battlefield of war on cancer.

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