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SCIENTIFIC ARTICLE

Predictive value of preoperative tests in estimating difficult intubation in patients who underwent direct laryngoscopy in ear, nose, and throat surgery

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KEYWORDS
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Abstract
Background and objectives: Predictive value of preoperative tests in estimating difficult intubation may differ in the laryngeal pathologies. Patients who had undergone direct laryngoscopy (DL) were reviewed, and predictive value of preoperative tests in estimating difficult intubation was investigated.
Methods: Preoperative, and intraoperative anesthesia record forms, and computerized system of the hospital were screened.
Results: A total of 2611 patients were assessed. In 7.4% of the patients, difficult intubations were detected. Difficult intubations were encountered in some of the patients with Mallampati scoring (MS) system Class 4 (50%), Cormack–Lehane classification (CLS) Grade 4 (95.7%), previous knowledge of difficult airway (86.2%), restricted neck movements (cervical ROM) (75.8%), short thyromental distance (TMD) (81.6%), vocal cord mass (49.5%) as indicated in parentheses ($p < 0.0001$). MS had a low sensitivity, while restricted cervical ROM, presence of a vocal cord mass, short thyromental distance, and MS each had a relatively higher positive predictive value. Incidence of difficult intubations increased 6.159 and 1.736-fold with each level of increase in CLS grade and MS class, respectively. When all tests were considered in combination difficult intubation could be classified accurately in 96.3% of the cases.
Conclusion: Test results predicting difficult intubations in cases with DL had observedly overlapped with the results provided in the literature for the patient populations in general. Differences in some test results when compared with those of the general population might stem from the concomitant underlying laryngeal pathological conditions in patient populations with difficult intubation.

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PALAVRAS-CHAVE
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Valor preditivo dos testes pré-operatórios para estimar a intubação difícil em pacientes submetidos à laringoscopia direta para cirurgia de ouvido, nariz e garganta

Resumo
Justificativa e objetivos: O valor preditivo dos testes pré-operatórios para estimar a intubação difícil pode diferir em patologias laríngeas. Foram feitas uma revisão dos prontuários de pacientes submetidos à laringoscopia direta (LD) e uma investigação do valor preditivo de exames pré-operatórios para estimar a intubação difícil.
Métodos: Triagem de prontuários dos períodos pré-operatório e intraoperatório e do sistema informatizado do hospital.
Resultados: Foram avaliados 2.611 pacientes. Em 7,4%, intubações difíceis foram detectadas. Intubações difíceis foram constatadas em pacientes com escore de Mallampati (EM), classe 4 (50%); classificação de Cormack-Lehane (CCL), grau 4 (95,7%); conhecimento prévio de via aérea difícil (86,2%); restrição da amplitude de movimentos (ADM) do pescoço (ADM cervical) (75,8%); distância tireomentoniana (DTM) curta (81,6%); e massa nas pregas vocais (849,5%) ($p < 0,0001$). O EM apresentou uma sensibilidade baixa, enquanto ADM cervical, presença de massa nas pregas vocais, DTM curta e EM apresentaram um valor preditivo positivo relativamente maior. A incidência de intubações difíceis aumentou 6.159 e 1.736 vezes com cada nível de aumento dos graus da CCL e da classe do EM, respectivamente. Quando todos os testes foram considerados em conjunto, a intubação difícil pôde ser classificada com precisão em 96,3% dos casos.
Conclusão: Os resultados dos testes que preveem intubações difíceis em casos com LD coincidiram claramente com os resultados previstos na literatura para as populações de pacientes em geral. As diferenças em alguns resultados dos testes, quando comparados com os da população em geral, podem ser por causa das condições patológicas subjacentes da laringe em populações de pacientes com intubação difícil.

Introduction

Many studies and meta-analyses have examined the predictive value of preoperative tests in determining difficult intubations. As laryngeal abnormalities are observed in direct laryngoscopic interventions in ear, nose, and throat surgery, the predictive values of these tests may differ. There appears to be no relevant studies in the literature in the patient population who had undergone direct laryngoscopy.

Direct laryngoscopy (DL) is performed to evaluate laryngeal structures, including the glottis and the vocal cords, by direct inspection. Abnormalities of this region are diagnosed by examining biopsy specimens prior to performing therapeutic interventions if necessary.

During this procedure, the most fundamental duty of the anesthetist is to provide adequate ventilation. The prerequisite of adequate ventilation is to ensure a safe and patent airway. Preoperative prediction of a potentially difficult intubation is important to make proper preparations and to plan an appropriate intubation technique. In the preoperative evaluation of difficult intubation, the mouth opening, the state of the tongue and palate, the thyromental distance (TMD), the sternomental distance, the cervical ROM and the mandibular mobility are assessed, and evidence of difficult intubation (if any) is investigated. In DL, routine preoperative indirect laryngoscopic examination findings also provide important information.[1,2]

In this retrospective study, we evaluated the anesthesia records of patients who had received anesthesia between 2000 and 2012 because of DL to investigate the predictive value of preoperative tests in difficult intubation.

Materials and methods

In this study, pre- and intraoperative anesthesia records of patients who had received anesthesia because of DL in the Department of Anesthesiology and Reanimation, Ondokuz Mayis University Faculty of Medicine between 2000 and 2012 due to DL were examined after obtaining the approval of the ethics committee. We previously published epidemiological examination results of anesthetic applications in patients who underwent DL during 2000–2010. In the current study, data relating to 2010–2012 were also evaluated, and preoperative predictive test results related to difficult intubation procedures were statistically analyzed in detail. Data obtained from the medical files of patients in the hospital-based computerized system were screened.

The following parameters were evaluated:

1. Age distribution of the patients who had DL: 0–1, 1–5, 5–15, 15–45 and >65 years,
2. Gender distribution and the number of patients who had DL,
3. Indications for DL. As pre-2005 data on DL indications were not available in the medical files, the indications for DL performed between 2005 and 2012 were included,