# DEVELOPMENT AND FEASIBILITY TESTING OF AN EARLY DETECTION PROTOCOL FOR LARYNGOSPASM DURING THE EXTUBATION PHASE OF GENERAL ANESTHESIA PATIENTS AT RSUD DR. MOHAMAD SOEWANDHIE SURABAYA

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## ABSTRACT

**Background:** Laryngospasm is an airway complication that may occur during the extubation phase in patients undergoing general anesthesia and may lead to airway obstruction, hypoxia, and cardiac arrest if not identified early. Early detection of laryngospasm remains limited because clinical signs often appear only after significant ventilatory impairment has occurred. To date, no early detection protocol has systematically integrated clinical risk factors and physiological indicators.

**Objective:** To develop and evaluate the feasibility of the *Detection Score Laryngospasm* (DSL) instrumen as an early screening tool for laryngospasm risk during the extubation phase in patients undergoing general anesthesia.

**Methods:** This study used a modified *Research and Development* (R&D) design consisting of four stages: needs analysis, product design, expert validation, and limited trial. The instrumen was developed based on age, LEMON criteria, history of upper respiratory tract infection (URTI), anesthesia stage, and changes in $\Delta EtCO_2$ values. Content validation was performed using the *Content Validity Index* (CVI) method by three expert validators. A limited trial was conducted on 30 patients undergoing general anesthesia and analyzed using Fisher's Exact test.

**Results:** All instrumen items met the validity criteria (I-CVI $\geq$0.78), with an S-CVI/Ave value of 1.00. The limited trial demonstrated that the instrumen could be applied during extubation observation and showed a significant association between DSL score interpretation and the incidence of laryngospasm ($p<0.001$).

**Conclusion:** The *Detection Score Laryngospasm* (DSL) instrumen was found to be valid and feasible as an early screening tool for identifying the risk of laryngospasm during the extubation phase in patients undergoing general anesthesia.

**Keywords:** laryngospasm, extubation, general anesthesia, *Detection Score Laryngospasm*, early detection

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# PENGEMBANGAN DAN UJI KELAYAKAN PROTOKOL DETEKSI DINI SPASME LARING PADA FASE EKSTUBASI PASIEN ANESTESI UMUM DI RSUD DR. MOHAMAD SOEWANDHIE SURABAYA

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## ABSTRAK

**Latar Belakang:** Spasme laring merupakan komplikasi jalan napas yang dapat terjadi pada fase ekstubasi pasien anestesi umum dan berpotensi menyebabkan obstruksi jalan napas, hipoksia, hingga henti jantung apabila tidak dikenali secara dini. Deteksi spasme laring masih terbatas karena tanda klinis sering muncul setelah terjadi gangguan ventilasi yang bermakna. Hingga saat ini belum tersedia protokol deteksi dini yang mengintegrasikan faktor risiko klinis dan indikator fisiologis secara sistematis.

**Tujuan:** Mengembangkan dan menilai kelayakan instrumen *Detection Score Laryngospasm* (DSL) sebagai alat skrining awal risiko spasme laring pada fase ekstubasi pasien anestesi umum.

**Metode:** Penelitian ini menggunakan metode *Research and Development* (R&D) yang dimodifikasi menjadi empat tahap, yaitu analisis kebutuhan, perancangan produk, validasi ahli, dan uji coba terbatas. Instrumen disusun berdasarkan usia, kriteria LEMON, riwayat infeksi saluran napas atas (ISPA), stadium anestesi, dan perubahan nilai $\Delta EtCO_2$. Validasi dilakukan menggunakan *Content Validity Index* (CVI) oleh tiga validator ahli. Uji coba terbatas dilakukan pada 30 pasien anestesi umum dan dianalisis menggunakan uji Fisher Exact.

**Hasil:** Seluruh item instrumen memenuhi kriteria validitas (I-CVI $\geq$0,78) dengan nilai S-CVI/Ave sebesar 1,00. Hasil uji coba menunjukkan instrumen dapat digunakan pada observasi fase ekstubasi dan terdapat hubungan bermakna antara interpretasi skor DSL dan kejadian spasme laring ($p<0,001$).

**Kesimpulan:** Instrumen *Detection Score Laryngospasm* (DSL) dinyatakan valid dan layak digunakan sebagai instrumen skrining awal risiko spasme laring pada fase ekstubasi pasien anestesi umum.

**Kata Kunci:** spasme laring, ekstubasi, anestesi umum, *Detection Score Laryngospasm*, deteksi dini

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