Relationship of difficult laryngoscopy to long-term non-insulin-dependent diabetes and hand abnormality detected using the ‘prayer sign’

Editor—About one-third of long-term insulin-dependent (type I) diabetics present with laryngoscopic difficulties.1 This is due, at least in part, to diabetic stiff joint syndrome characterized by a short stature, joint rigidity, and tight waxy skin.2 The fourth and fifth proximal phalangeal joints are most commonly involved. Patients with diabetic stiff joint syndrome have difficulty in approximating their palms and cannot bend their fingers backwards (the prayer sign, Fig. 1). This is due to non enzymatic glycosylation of collagen and its deposition in joints. When the cervical spine is involved, limited atlanto-occipital joint motion may make laryngoscopy intubation difficult.

The aim of this study was to evaluate the frequency of difficult laryngoscopy in long-term type II diabetic patients, and to determine its relation to the prayer sign.

In this prospective study, 80 type II diabetic patients (Group D) and 80 non-diabetic patients (Group ND) undergoing elective surgery under general anaesthesia were studied. Exclusion criteria in both groups were as follows: patient with arthritis, carpal tunnel syndrome, Dupuytren’s contracture, or obvious anatomical variation of the face, neck, palate and hands. Patients with diabetes of <10 yr duration were added to Group D. All patients were evaluated preoperatively, using four physical indices predictive of difficult laryngoscopy and intubation, namely: degree of head extension, thyromental distance, Mallampati classification, and the prayer sign.

To evaluate the prayer sign, patients were asked to approximate the palmar surfaces of their hands. If the palmar surfaces of phalangeal joints touched completely, the prayer sign was negative. If the palmar surfaces of the phalangeal joints could not be approximated despite maximal effort, the prayer sign was positive.

Anaesthesia was induced with thiopental sodium (4–6 mg kg⁻¹) and succinylcholine (1.5 mg kg⁻¹). Laryngoscopy was performed using a Macintosh blade. The laryngeal view without external laryngeal pressure applied to the cricoid cartilage was based on the criteria of Cormack and Lehane. Grade 3 and grade 4 laryngoscopic views were considered as difficult laryngoscopy.

Results are expressed as mean±sd. Fisher’s exact test was used to compare proportions. P values =<0.05 were used to denote statistical significance. There were no differences in the physical characteristics of the two groups. Mean (sd) (range) duration of diabetes in Group D was 14.74±4.95 (10–36 yr) yr. The results are given in Table 1.

The incidence of difficult laryngoscopy was 18.75% in Group D and 2.5% in Group ND. A statistically significant increase in difficult laryngoscopy was noted in patients in Group D (P=0.0014). The incidence of the prayer sign was 31.25% in Group D and 13.75% in Group ND. A statistically significant increase in the incidence of the prayer sign was noted in patients in Group D (P=0.0132). Four patients in Group D with the prayer sign had a difficult laryngoscopy. There was no significant association between difficult laryngoscopy and the prayer sign (P=1.000).

Hand abnormalities such as thickened tight waxy skin, and limitation of small joint mobility are common manifestations of diabetes.3 Although small joint mobility is usually limited to the hand, other joints might be involved.4,5 The term limited joint mobility (LJM) describes this phenomenon. It is seen more frequently in type I and type II diabetic patients than in the general population. The duration of diabetes and age are important variables in the development of the LJM syndrome, but it is not associated with the degree of metabolic control.6 Limitation of small joint mobility in the hand, when severe, is easily detectable by the prayer sign.5 The degree of interphalangeal joint involvement can also be objectively assessed by scoring the ink impression made by the palm of the dominant hand (palm print test).7 The prayer sign is a more simple bedside test for interphalangeal joint involvement.5 However, it can be detected in normal individuals.4 In our study, 13.75% of non-diabetic patients had the prayer sign. In the hands of diabetic patients, we have demonstrated a significant increase in LJM compared with non-diabetic patients as assessed by the prayer sign. The incidence of difficult laryngoscopy in long-term diabetic patients is high (27–31%),1–9 In our study it was 18.75%. The incidence of difficult laryngoscopy has been shown to be high in diabetic patients with LJM diagnosed using the palm print test.7–9 In this study, however, there was no relation between the prayer sign and difficult laryngoscopy.

![Fig 1 The prayer sign. The patient is unable to approximate the palmar surfaces of the phalangeal joints despite maximal effort.](Image 87x102 to 251x324)

<table>
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<th>Table 1 Difficult laryngoscopy and the prayer sign in both groups</th>
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<td>Patient type</td>
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Correspondence
In conclusion, our findings confirmed an increase in difficult laryngoscopy and the prayer sign in long-term type II diabetic patients, but there was no relation between the prayer sign and difficult laryngoscopy.

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