USE OF GOW-GATES MANDIBULAR NERVE BLOCK BY NEW DENTAL GRADUATES A SURVEY

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ABSTRACT

This cross-sectional, descriptive, questionnaire based survey was performed to document the frequency of use of Gow-Gates mandibular nerve block for dental procedures by new dental graduates in Lahore. Questionnaires were distributed to 197 House Officers from four dental colleges of Lahore. Data were analyzed using Statistical Package for the Social Sciences (SPSS). Half (51.3%) of the house officers claimed to know the technique for Gow-Gates. Training for administration of Gow-Gates had been received by 15.7%. The mean self-perceived competence level at Gow-Gates injection, on a scale of 0-10 was 2.55 (S.D 2.9).

Key Words: *Mandibular local anesthesia, Inferior alveolar nerve block, Gow-Gates technique, Vazirani Akinosi block, mandibular molar teeth, supplementary local anesthetic technique, nerve block.*

INTRODUCTION

The standard technique for achieving mandibular anesthesia for routine dental procedures is by the use of the Inferior Alveolar Nerve Block (IANB). However, reported failure rates for IANB are high, ranging from 31% to 41% in mandibular second and first molars, 42% in second premolars, 38% in first premolars, 46% in canines and up to 81% in lateral incisors. Gow- Gates (GG) has a higher success rate ranging from 91% to 95%[1] with a very low failure rate mostly due to improper technique. Gow-Gates may be used as a primary local anesthesia technique or as a supplementary technique after failure of Inferior alveolar nerve block.[2-4]

To administer Gow-Gates, first, the tissue targeted for needle insertion is dried with sterile gauze and topical anesthetic gel is applied. The extra-oral and intraoral landmarks are located as follows: (1) extra-oral landmarks are lower border of the tragus (intertragic notch) and the corner of the mouth; and (2) intraoral landmarks include the height of injection established by placement of the needle tip just below the mesio-palatal cusp of the maxillary second molar. The tip of the needle is moved to a point just distal to the molar. After completion of the localization of landmarks, the syringe is directed, and the needle is gently inserted, and then slowly advanced until contact with

the bone of the anterior condyle is made. The needle is withdrawn 1 mm when this bone contact is confirmed. If bone contact is not obtained, the needle is slightly withdrawn and redirected. No local anesthesia must be deposited if the bone is not contacted. Aspiration is then performed to avoid intravenous injection. The patient is asked to keep his/her mouth open for 1-2 minutes after injection.[1,5-8]

Gow-Gates mandibular nerve block provides sensory anesthesia to virtually the entire distribution of V3. The inferior alveolar, lingual, mylohyoid, mental, incisive, auriculotemporal, and buccal nerves are all blocked.[1,11] Significant advantages of the Gow-Gates technique over IANB include its higher success rate, its lower incidence of positive aspiration (approximately 2% vs. 10% to 15% with the IANB) and the absence of problems with accessory sensory innervation to the mandibular teeth.[10,13]

Although Gow-Gates has high efficacy[1,9,10], most dentists have not adopted this technique, possibly due to inadequate training and practice, or a perception of in-creased pain associated with the injection and increase patient anxiety.[1] However, multiple randomized controlled clinical trials have found no significant differences in pain on injection among the three techniques used for achieving mandibular anesthesia: standard inferior alveolar nerve block, Gow-Gates mandibular block, and Vazirani Akinosi mandibular block.[15,16]

The objective of this study was to document the use of Gow-gates mandibular nerve block by new dental graduates to achieve mandibular nerve block for dental procedures in various dental institutes of Lahore. Structured training of Gow-Gates is not part of the curriculum in Pakistan and the technique is not evaluated in the undergraduate examinations.

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METHODOLOGY

This descriptive cross sectional questionnaire based survey was performed in June 2016. Approval was taken from Institutional Review Board (IRB) of IOD, CMH Lahore, and from the heads of 3 other dental colleges in Lahore namely: Lahore Medical and Dental College (LMDC), Fatima Memorial Hospital (FMH) College and Sharif Medical and Dental College, Lahore. Data collection form was piloted and modified. The Questionnaire was administered to all house officers in 4 dental colleges of Lahore, and collected on the same day. House officers who did not return the forms were reminded personally or on the phone thrice over the following week. Data was analyzed using Statistical Package for the Social Sciences (SPSS, ver. 23, IBM Corporation, Armonk NY, USA, 2015). Frequencies and means were calculated for nominal and continuous univariate analysis. Chi-square, Mann Whitney U and Spearmen's rho tests were used for bivariate analysis. A p value of <0.05 was set as the level of statistical significance.

RESULTS

There were a total of 197 House Officers in this study. Mean age was 24.28 S.D ± 3. There were 52 (26.4%) male House Officers (intern), and 145 (73.6%) female house offices from 4 different colleges of Lahore. See Table 1.

The most frequent year of graduation was 2015 (n=93, 52.8%) followed by 2016 (n=50, 28.4%). Data for year of graduation was missing for 21 house officers. See Fig. 1. Half (51.3%, n=101) of the participants claimed to know the technique for Gow-Gates mandibular anesthesia. Mean self-perceived competence level for Gow-Gates on a scale of 0-10 was 2.55, SD± 2.9 (median 2, mode 0).

House officers who knew how to administer Gow-Gates had a mean self-percieved competence level of 4.14 SD±2.8 (median 5) while those who did not know
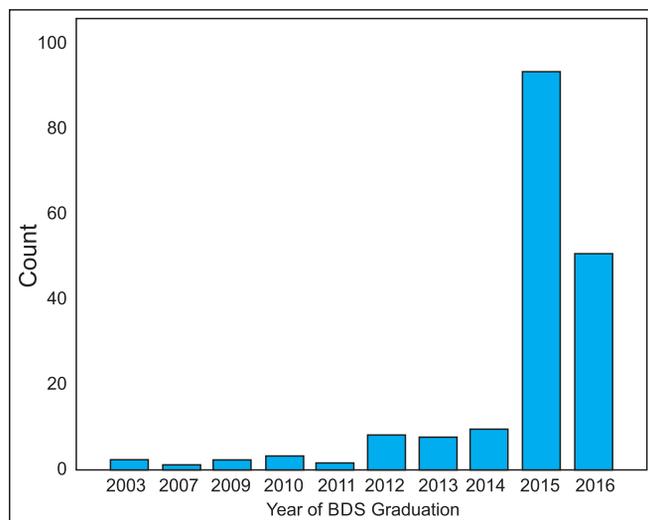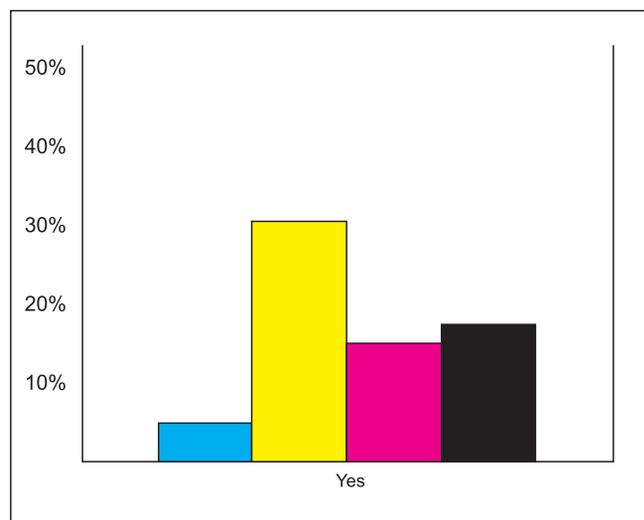

Fig 1: Year of BDS graduation of respondants

Fig 2: Frequency of training for Gow-Gates mandibular block in four institutes of Lahore

TABLE 1: AGE AND GENDER DISTRIBUTION OF RESPONDENTS FROM DIFFERENT COLLEGES

Participants & College	n	Mean Age years (SD)	Gender %	
			Male	Female
CMH	55	23.9(4.4)	16.4	83.6
FMH	32	23.9(1.3)	37.5	62.5
LMDC	59	25.1(2.4)	25.4	74.6
SMDC	51	23.9(2.4)	31.4	68.6
Total	197	24.3(3)	26.5	73.6

the technique had a mean competence level of 0.85 SD±1.7, (median 0, p < 0.0001, Man Whitney U test).

The frequency of house officers who could administer Gow-Gates without supervison was 23.9% (n=47). Participants from FMH had the highest frequency (37.3%) with the lowest in LMDC (18.6%) and SMDC (19.6%). The differences were non-significant (p=0.19).

Significantly higher frequency of male House Officers (36.5%, n=19) claimed they could administer Gow-Gates without supervison compared to female House Officers (19.3%, n=28, p=0.012, Chi-Square).

Training for Gow-Gates had been received by 15.7% (n=31) of the House Officers. The Highest frequency of training was in FMH (31.3%, n= 10, p= 0.016, chi-square). See Fig 2. There was a strong, highly significant positive correlation (rho=0.701, p=0.0001, Spearman's rho) between number of Gow-Gates injections administered and the mean competence level.

DISCUSSION

Gow-Gates, invented by Australian dentist George A.E. Gow-Gates in the mid-1970s, has a success rate of over 91%.[4] However, it is seldom used as a primary technique for achieving mandibular anesthesia possibly due to inadequate training and practice, or a perception of in¬creased pain associated with the injection and increase patient anxiety.[1] Advantages of Gow-Gates include higher success rate in comparison with

IANB, decreased incidence of positive aspiration and increased area of anesthesia. One research estimates that only 3.7% to 16.1% of clinicians having training in Gow-Gates technique use this injection technique primarily and between 35.4% and 56.3% of those trained in the Gow-Gates method never use this technique.[15] Despite advantages, dentists may not have embraced this technique, possibly due to lack of confidence in successful administration of Gow-Gates or out of fear of increased pain associated with the injection[1], even though this perception is not supported by research.[15,16]

Half (51.3%, n=101) of the House Officers in this study claimed to know how to administer Gow-Gates, with a low self-perceived competence level of 2.55, (median 2, mode 0) on a scale of 0 to 10. However, only 15.7% (n=31) of the House Officers had received training indicating lack of structural training in 4 dental colleges of Lahore. In comparison, training had been received by 81% pre-doctoral students and 14% post-doctoral students as a part of their academic training in another institution.[14]

This research indicates that structured training of Gow-Gates is not part of the curriculum in Pakistan and the technique is not evaluated in the undergraduate examinations. After graduation, 76.1% of new graduates felt they could not perform Gow-Gates without supervision.

Achieving profound mandibular anestheisa for dental procedures has always been a challenge for dentists due to the commonly used Inferior Alveolar Nerve Block having a high failure rate.[1] The rationale of this study was to assess the training of Gow-Gates to be used as a primary and as a secondary technique when Inferior Alveolar Nerve Block and Vazirani Akinosi has failed. Although Gow-Gates is taught as a supplemental technique Internationally, Structured training is lacking in Pakistan. Training for Gow-Gates had been received by 15.7% of our participants, highlighting the need for inclusion of this topic in the undergraduate curriculum. Competance at this technique will add a valuable management option for dentist when trying to achieve mandicular anesthesia.

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