Age, Gender And Dental Pain Perception

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Citation

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Abstract

We sought to determine the effect of age and gender on the perception of dental pain in Nigerian subjects. The setting for the study was the Dental Hospital, Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife, Nigeria. 317 subjects, (142 males and 175 females) with healthy maxillary central incisors, whose ages ranged from 10 to 82 years, were involved in the study. The subjects were grouped into four according to their ages i.e. 10-19 years, 20-40 years, 41-60 years and >60 years and labelled as adolescents, the young, middle aged and the elderly respectively. For each subject, the maxillary right central incisor was carefully dried and isolated from saliva. Its pain threshold was determined using a digitest vitality tester (Model No D6260) as the stimulator. The score was noted and recorded against the age and gender of the subject. The data collected for all the subjects were analysed using SPSS version 11.0 for windows.

There was a statistically significant difference in the stimulation scores (pain thresholds) recorded among the various age groups. Also, a significant correlation existed between the age distribution and the stimulation scores recorded by the subjects. There was however no statistically significant difference or correlation between the stimulation scores reported and the subjects' gender.

Older subjects in this study had a significantly lower pain threshold than the younger ones. The subjects' gender did not influence their dental pain perception.

INTRODUCTION

Dental pain is perceived through the stimulation of the mandibular and the maxillary branches of the trigeminal nerve (the 5th cranial nerve). According to Bowsher ([1]), the afferent fibres of the trigeminal system travel via the gasserian ganglion, where their cell bodies are located, to enter the pons at the lateral aspect. Fibres concerned with discriminative tactile sensation, touch and pressure, synapse in the main sensory nucleus of the trigeminal nerve, thereafter ascending to the primary somatosensory cortex via the thalamus.

Pain and temperature fibres, however, follow the descending spinal tract of the trigeminal nerve. Neurones in the descending spinal tract synapse with the second-order neurones of the spinal nucleus of trigeminal. The majority of the fibres, which arise in the spinal nucleus, cross the median plane (decussation) and ascend to the ventral posterior medial nucleus of the thalamus. The third order neurones project from the thalamus to the parietal lobe of the cortex via the posterior limb of the internal capsule.

Various studies ([2,3,4,5,6,7]) have reported the effect of age and gender on response to pain generally including dental pain but the reports have been diverging and conflicting in their conclusions.

In a study of the effects of gender and age on the examination of the colon among 108 and 72 female and male patients respectively, Ristikankare et al ([2]) reported that immediately after the colonoscopy the women reported more significant pain than men. A repeat questionnaire two weeks after the examination revealed that women still rated colonoscopy more painful and difficult than men. Also, the endoscopist judged colonoscopy to be more difficult and the time taken to reach the caecum longer for women.

The young patients (aged 20-40 years) in this series experienced more discomfort than the middle-aged (aged 41-60 years) or the old (aged 61-75 years) as evaluated after the colonoscopy. In the repeated questionnaire the young patients reported more discomfort and pain than the middle-aged. The endoscopist however judged the examination to be more difficult in the aged than for the middle-aged or the

young.

Ristikankare et al ([2]) concluded that colonoscopy was less tolerable and more difficult for women than men. Although colonoscopy among the old patients was technically more difficult they tolerated the procedure better than the young.

Subramaniam et al ([3]) evaluated the efficacy of the combination of epidural ketamine and morphine (group I) compared with epidural morphine alone (group II) for post-operative pain relief following major upper abdominal surgery. They reported that there were no differences between the two groups with respect to age and gender.

Averbuch and Katzper ([4]) in their study on a search for gender differences in response to analgesia compared analgesic response of females and males to ibuprofen in a post-third-molar extraction dental model. They concluded that the effect of gender on the analgesic response to ibuprofen could not be demonstrated. Similarly, Averbuch and Katzper ([5]) in their study on gender and the placebo analgesic effect in acute pain following third molar surgery found that there was no gender difference in response to placebo. However, the post-operative baseline pain was significantly greater in female subjects than males.

Slater ([6]) in his study of the patterns of access to public oral health care in Queensland, Australia, by gender, indigenous status and rurality reported that males were more likely to attend dental clinics when a problem with pain existed. Indicating that females could tolerate the pain more. However, Seymour et al ([7]) reported that women who had pulpitis and pericoronitis reported higher level of pain than men did, indicating that men could tolerate dental pain more contrary to the report of Slater ([6]).

Upon a background of dearth of reports in Black Africans and in view of the conflicting existing reports the present study aims to determine the effect of age and gender on dental pain perception following the stimulation of the tooth with a digitest vitality tester in Nigerians.

METHODS

This study was conducted at the Dental Hospital, Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC) Ile-Ife, Nigeria. The subjects were pain-free patients and volunteers who were randomly selected for the study. The pain free patients reported to the Dental Hospital with various complaints, which did not involve their permanent maxillary central incisors. Selection criterion included the possession of fully erupted and clinically healthy permanent maxillary incisors, which had no restorations and were free from pain. Informed consent was obtained from all subjects having explained the details and extent of the study.

Subjects were properly seated on the dental chair. The right maxillary central incisor was carefully dried with gauze and isolated from saliva. A digitest vitality tester (Model No D6260) was used as the stimulator. Its sterile removable probe was smeared at the tip with toothpaste, which acted as the conducting gel. The tip was placed on the labial surface of the right maxillary central incisor and tester held at the metal sheath with an ungloved hand.

The button was pressed to start off the stimulation from zero (0) and the reading continued to increase as long as the button was still being pressed down. The maximum reading on the tester is 64. Prior to stimulation, the subjects were instructed to indicate the perception of any sensation by raising up of the index finger. Upon indication by the subject, the operator released the button and the particular simulation intensity (pain threshold) would remain on the digital display for a few seconds. This stimulation intensity was noted and recorded against the age and gender of the subject. This procedure was carried out for all the subjects. The data collected were analysed using SPSS version 11.0 for windows. Level of significance was inferred at $p< 0.05$.

RESULTS

Three hundred and seventeen subjects were involved in the study. They were 175 females and 142 males whose ages ranged from 10 to 82 years with mean at 31.1 ± 17.1 years and median 28.0 years. The difference in subjects' gender distribution was not statistically significant, $p = 0.33$ (Table 1). Subjects were grouped into four, based on their ages i.e. 10 – 19 years, 20 – 40 years, 41 –60 years and > 60 years and labelled as adolescents, the young, middle aged and the elderlies respectively. The young constituted the majority (43.8%) while the elderlies were in the minority (9.8%), Table 1.

Figure 1

Table 1: age and gender distribution of subjects

AGE (Years)	MALES No (%)	FEMALES No (%)	TOTAL No (%)
10 – 19	43 (30.1)	52 (29.7)	95 (30.0)
20 – 40	64 (45.1)	75 (42.9)	139 (43.8)
41 – 60	22 (15.5)	30 (17.1)	52 (16.4)
61 and above	13 (9.2)	18 (10.3)	31 (9.8)
TOTAL	**142 (44.8)**	**175 (55.2)**	**317 (100)**

$\chi^2 = 0.33$, df = 3, p = 0.96

The stimulation scores recorded for the subjects ranged from 2 – 21units. The distribution of the scores by subjects' age group and gender is as shown in Tables 2 and 3 respectively. Table 2 shows a statistically significant difference in the scores recorded among various age groups (p = 0.00).

Figure 2

Table 2: distribution of subjects' stimulation scores by age groups

AGE (Years)	SCORES				
	≤ 5	6 – 10	11- 16	> 16	Mean Scores
10 – 19	1	40	41	13	11.5
20 – 40	43	74	19	3	7.3
41 – 60	30	21	1	-	5.5
>61	22	8	1	-	5.5
TOTAL	**96**	**143**	**62**	**16**	-

$\chi^2 = 124.3$, df = 9, p = 0.000.

Also a significant correlation exists between the age distribution and the stimulation scores recorded by the subjects (p = 0.00). The adolescents and the young had higher mean stimulation scores of 11.5 and 7.3 units respectively, while both the middle aged and the elderlies recorded mean score of 5.5 units each. The pattern observed is a reducing stimulation with increasing age i.e. the older patients' teeth were more responsive than in the younger patients. There is however no statistically significant difference or correlation between the stimulation scores reported and the subjects' gender (p = 0.98 and p = 0.7)(Table 3).

Figure 3

Table 3: Distribution of subjects' stimulation scores by gender.

SCORES	MALES No (%)	FEMALES No (%)	TOTAL No (%)
≤ 5	42 (30.3)	54 (30.9)	96 (30.3)
6 – 10	64 (45.1)	79 (45.1)	143 (45.1)
11 – 15	28 (19.7)	34 (19.4)	62 (19.6)
16 and above	8 (5.6)	8 (4.6)	16 (5.0)
TOTAL	**142 (44.8)**	**175 (55.2)**	**317 (100)**

$\chi^2 = 0.221$, df = 3, p = 0.98

DISCUSSION

Dental pain is elicited through the stimulation of the mandibular or maxillary branches of the trigeminal nerve, the 5th cranial nerve ([1]). From the present study the subject's age could influence the perception of this pain. The adolescents and the young recorded mean stimulation scores of 11.5 and 7.3 units respectively while both the middle-aged and the elderlies recorded scores of 5.5 units each (Table 2). These differences are statistically significant (p = 0.00). It thus indicates that the older people have a lower dental pain threshold than the younger in as long as the teeth remain vital.

A plausible reason for this might be the greater dental exposures (treatments and information) that the elderlies might have had over the years compared to the younger ones; these tend to increase their anxiety level. According to Kakko and Murtomaa ([8]) subjects who have had previous dental treatments (painful or non-painful) presented higher anxiety before tooth extraction than did subjects without such experience and an increased anxiety prior to dental treatment has been associated with enhanced pain ([9], [10]). In fact, Litt ([10]) described dental procedures as acute stressors, which could be associated with anxiety and great pain.

However, in the study by Ristikankare et al ([2]) it was reported that immediately after colonoscopy the young (aged 20-40 years) experienced more discomfort than the middle-aged (41-60 years) or the elderly (61-75 years). This is at variance with our finding. The “acute stressor” effect of dental procedures as described by Litt ([10]) might have contributed to our finding. This may not be so with colonoscopy since it is not done as frequently as dental

procedures.

Subramaniam et al ([3]) reported that there was no difference with respect to age, in post-operative pain relief, in two groups of patients following upper abdominal surgery. The first group had a combination of epidural ketamine and morphine while the second group had only epidural morphine. This is at variance with our finding as well as that of Ristikankare et al ([2]).

Our study also showed no significant correlation between the stimulation scores reported and subjects' gender ($p = 0.7$) (Table 3). The dental pain thresholds did not differ significantly between the male and female subjects.

Similarly, in a study on the search for gender differences in response to analgesia, Averbuch and Katzper ([4]) compared analgesic response of females and males to ibuprofen in a post-third molar extraction model and concluded that there was no gender effect on the analgesic response to ibuprofen.

A similar conclusion was made by Averbuch and Katzper ([5]) in their post-third molar extraction study on gender and the placebo analgesic effect in acute pain; there was no gender response to placebo. However, the post-operative baseline pain was significantly greater in females than males.

However, Slater ([6]) in his study of the pattern of access to public oral health care in Queensland, Australia, by gender, indigenous status and rurality, reported that females could tolerate dental pain more than males. In contrast to this finding, Seymour et al ([7]) in their evaluation of dental pain using visual analogue scales and the Mcgill Questionnaires reported that men could tolerate dental pain more than women.

The present study therefore concludes that in Nigerians, older subjects, ≥ 41 years old, showed significantly greater response than the younger subjects to dental pain. However, the subjects' gender did not affect their perception of dental pain.

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