Impacted third molars ("wisdom" teeth): a new risk factor for depression in young adults and adolescents?

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Abstract

Inspired by theoretical and epidemiological considerations, this study investigates the relationship between depression, mood swings, reports of suicidal thoughts and third molar ("wisdom tooth") status in a group of adolescents and young adults. The group comprised 39 girls and 24 boys who visited dental practices in the Netherlands. The ages ranged from 16 to 26. Zung's Self-rating Depression Scale (SDS)[19] was used for assessing depression. All subjects were x-rayed for the status of possible wisdom teeth. Young adults and adolescents with an impacted third molar (molars that were fully surrounded by jaw bone tissue) showed significantly higher depression scores than young adults and adolescents who did not have such an impacted molar. These outcomes were not influenced by age or gender. The results of the study imply that the fields of dental care and psychological care may be more interrelated than understood thus far. K*eywords*: depression, adolescents, third molars, suicidal thoughts.

Introduction

From research conducted by the University of Leiden, the Erasmus University at Rotterdam, in cooperation with Keesings Publishing Company and the National Institute for Budgetary Advice (NIBUD), it appears that five percent of high school students claim to have tried to commit suicide at or another. Moreover, the fact that one in five of adolescents admit to have seriously considered it, is a cause of serious concern, and rightly so, to the community at large and to mental health in particular.

About 20 years ago, two authors - independently from each other - have noticed the interrelationship of impacted third molars on depression (Voll, 1977[18]; Adler, 1983[1]). From personal case studies, they described the observation of a significant increase in depression, anorexia, apathy, and anxiety in persons associated with impacted third molar problems. They proposed that there is a causal relationship.

Voll[18] pointed out in detail the interrelationship between teeth, organs and organic systems. His measurements showed humoral, neural and hormonal reactions. Followed later by Sollmann, Angerer and Mastalier[15]. Ernesto Adler in particular, has described the wisdom tooth as being a *'bad luck'* tooth. Perhaps these remarks have not been made unjustly?

May be an example of one of these pre-sensibilisation effects of the neuro-vegetative system was mentioned by De Bruïne Ploos van Amstel (1933)[4]. He was one of the first authors who declared that during the phase of the primary teeth eruption in infants, various gastro-intestinal disturbances, such as diarrhoea, occur. When the teeth broke through, the symptoms disappeared. For the purpose of this study we limit us ourselves to a discussion of the interrelationship between the localization of wisdom-teeth during the (difficult) eruption process on the one hand and depression on the other hand in young adults and adolescents.

Background Various epidemiological studies provide evidence that support this theory. For instance, depression and negative mood swings occur for many people during adolescence, at the same time as the third molars are erupting. Before the age of twelve these feelings are extremely rare (Rutter, Tizard & Whitmore, 1970)[13], but not during adolescence: Kandel & Davies[8]have reported in a sample of 8,000 students aged 14-18 have over 40% of the boys and almost 60% of the girls regularly reported negative mood swings and depression.

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A Dutch study among students (Secondary Education), Kienhorst, Van den Bout & Broese van Groenou (1985)[11] found that almost 8% of almost 10,000 adolescents suffered depression. Reports about serious depression vary from 1,3 tot 2,9% (Kandal & Davies[8], 1982; Schoenbach, Kaplan, Grimson & Wagner, 1982[14]; Kaplan, Hong & Weingold, 1984)[9].

There is also evidence that both phenomena (depression and impaction of third molars) have shown an increase in the last decades. The Cross-National Collaborative Group (1992)[5] observed an increase in depression among youngsters in the last decades. The risk of depression before age 30 has doubled. Remarkable is the increase in depression when the third molars are erupting.

This has caused the jaw to become smaller and therefore the retro molar spaces to become smaller, leaving less space for third molars to erupt (Adler, 1983)[1]. Eventhough there is a lot of literature about their location and dental disturbances, it has only been in the last few years that the remote effects of this 'focus' has been examined and documented. Because of his experience as a dentist and researcher, Adler delivered a lecture at the medical faculty of the University of Barcelona for the first time in 1951. He talked here about wisdom-teeth, calling them *Patologia focal dentaria.* Despite theoretical and epidemiological statements in complementary medicine, the interrelationship between depression, on the one hand. and third molar status, on the other, has never been systematically investigated. The present study is just a very modest attempt in this direction.

Method

Subjects

The group was comprised of 39 girls (62%) and 24 boys (38%), who visited 10 different dental practices in the Netherlands. Their ages ranged from 16 to 26 years (mean age 21.4, sd 2.7). 35 percent of these adolescents/young adults had parents with university education, 54% secondary education and 11 % primary education. 28 percent had a full-time job, 44% a part time job, most of whom combined this with a specific type of education. 55 of the adolescents/young adults were of Caucasian descent, eight adolescents had a non-Caucasian mother or father.

Impaction of at least one wisdom tooth occurred in 41 adolescents (65%), whereas 27 (43%) had at least one partially erupted wisdom tooth (these percentages may comprehend the same adolescents) In 34 (54%) of the adolescents, at least one of the four possible third molars was not found at all. After informing them, consent was obtained from all subjects.

Measures

Participants were requested to complete a self-report questionnaire prior to their dental examination or treatment. For each individual the dentist completed a separate form, in which the status of the third molars was noted. Of each participant, the following information was obtained:

1. Self-report questionnaire

A self-report questionnaire - adapted from earlier adolescent suicide research (Kienhorst et al., 1994; De Wilde et al., 1995)[11] - was constructed and several questions were added about socio-demographic characteristics, suicidal behaviour and suicidal thoughts, depression, mood swings and the Self-rating Depression Scale (SDS), (Zung, 1965)[19]. This 20-item list is used for assessing depression in adults as well as adolescents. Scores range from 20 (low) to 80 (high). Higher scores indicate a depression. In various studies, a cut-off point of 46 is used: subjects who score higher than this score are considered to be depressed. In three samples, derived from a Dutch sample of 8,326 adolescents, Cronbach's were found, varying from 0.76 to 0.80 (Kienhorst, 1988).

2. Position of Third Molars

From each subject, all four spaces where possible wisdom teeth could be found were X-rayed. The dentist then evaluated the status of each wisdom tooth: The tooth could be (a) impacted, (2) partially erupted (retinated), (3) completely erupted, or (4) not present (see fig. 1).

3. Differentiation

In this study the anatomic position of wisdom teeth were classified as ‘impacted’ when they were fully surrounded by jaw bone tissue (fig. 1b) and were classified as ‘complete eruption’, whenever the crown of the molars had fully surfaced, in line with the other molars, and capable of occlusal and chewing functions (1c).

All positions of a present wisdom tooth in between the aforementioned location capabilities were classified as partially erupted ('retinated') (1d).

Data analysis

Student's *t* was calculated to compare means of the Self-rating Depression Scale total scores between adolescents and young adults with an impacted 3rd molar and adolescents without an impacted 3rd molar. By means of analysis of variance, the significance of these differences were then established by correction for age and gender. This procedure was repeated for groups defined by absence or presence of impacted wisdom teeth in the upper jaw, lower jaw, left side or right side respectively. Chi-square and Odds-ratios were used to compare the distribution of adolescents andg adults with and without suicidal thoughts among the various groups defined as above. Here

Wisdom teeth could be absent (1a) because of extirpation, (surgical) extraction, or by non-development.

as well, differences were corrected for sex and age by means of analysis of variance.

Results

Table 1 shows the mean scores of the adolescents and/or young adults defined by impaction of a third molar in any side or jaw, in upper jaw, lower jaw, in left side and right side respectively. Although the horizontal distinction between the groups (absent or present impaction) is exclusive, the vertical is not; there were adolescents with an impacted third molar on the left side of the upper jaw.

Table 1. Differences in Selfrating Depression Scale total score between adolescents and young adults with or without impacted third molars

	No			Yes				
	n	mean SDS	sd	n	mean SDS	sd	t	p
Impaction								
in any side or jaw	20	39.5	7.8	37	44.5	9.9	-1.96	.055
in upper jaw	25	39.0	7.6	32	45.7	9.8	-2.84	.006
in lower jaw	37	42.4	8.4	20	43.5	11.2	-.41	.687
in left side	26	40.0	8.1	31	45.0	10.0	-2.04	.046
in right side	29	41.1	9.2	28	44.5	9.5	-1.38	.173

ll groups defined by a presence of an impacted third molar showed higher depression scores than the groups defined by the absence of that molar. Two differences are statistically significant: the difference between the group of adolescents and young adults with an impacted third molar in the upper jaw and the group without, and the group with an impacted third molar on the left side of the face and those without. Anova's showed that there was a significant age effect in all comparisons (older adolescents scoring higher on depression,

F < .05 in all comparisons), which did not change the results for the 'upper' factor. However, it did result in non-significance for the 'left-side' factor. Interestingly, an interaction with age was found here: of those with an impacted third molar on the left side, girls showed higher scores (actually very high, the mean score of these 18 girls was 48.6) , whereas of those without, boys scored higher.

Table 2. Differences in Suicidal Thoughts between adolescents and young adults with or without impacted third molars (% of adolescents who reported suicidal thoughts)

	No		Yes			
	n	%	n	%	OR	
Impaction						
in any side or jaw	22	22.7	40	60.0	2.64	*
in upper jaw	27	29.6	35	60.0	2.03	*
in lower jaw	42	36.6	21	66.7	1.82	*
in left side	28	28.6	34	61.8	2.16	*
in right side	32	37.5	30	56.7	1.51	

The majority of any group who had an impacted third molar reported having had suicidal thoughts at some time during his or her life. The differences were most significant for the 'general' factor, the 'upper' factor and the 'left' factor. Almost three times as many adolescents reported suicidal thoughts among the group with an impacted third molar than the group without an impacted third molar. These differences did not change when corrected for age and gender. There was a significant age effect for all comparisons (more older adolescents reporting suicidal thoughts).

Discussion

In this study, a relationship was found between the third-molar dentition status and self-reported depression and suicidal thoughts in a sample of 63 young adults and adolescents. Young adults and adolescents with an impacted third molar showed significantly higher depression scores than young adults and adolescents who did not have such an impacted molar. These outcomes were not influenced by age or gender.

Before discussing the implications of these results, some comments are warranted. First of all, a relationship as shown in this study does not automatically imply the causality of depression. In the introduction, a theoretical basis was given that might describe a causal framework for the connection between well-being and status of the third molar especially during the eruption process of this tooth, but this theory was not tested in all its facets in this study. The present study is merely a first exploration in this respect. A double-blind study is advised to involve pre- and post-test experiments of groups that had or had not had their impacted third molar removed. The search of a risk factor for depression in this specific field does not exclude the significance of (combinations of) other risk factors, be they biological, psychosocial, hereditary, etc. Furthermore, it cannot be excluded, impacted and /or partially erupted wisdom teeth may be found in older population with negative mood swings than adolescents. Secondly, this concerns a small-scale study, which uses, besides X-ray photography, self-report questionnaires to establish the psychological measures.

The validity and reliability of the Self-rating Depression Scale has been established in numerous other studies; to measure suicidal thoughts, answers to a single question were used. This method was used in a number of adolescent studies of attempted suicide and has also proved its worth.

The questionnaire used in itself is a significant predictor of future and past suicidal behaviour (Kienhorst et al., 1990). Nevertheless, a more thorough estimate with general measures (un)well-being seems to be recommend in future research.

The results do not falsify the prediction that can be made following the theoretical framework described in the Introduction. The position (dentition) status of third molars in the (1971)[15] describes a *'more aggressive'* outcome of disturbances in the left jaw. Further research seems to be warranted, in this respect.

The results of the study imply that the fields of dental care and psychological care may be more interrelated than practised thus far. It seems advisable to be aware of the possibility of impacted third molars in the diagnosis of depression among adolescents and young adults. Along with numerous other risk factors for depression, dentition status has to be established. Vice versa, dentists should be aware of a more than average amount of depression symptoms in adolescents they treat for impacted molars. If a permanent impaction is to be expected by growth, status, or orthodontic corrections, the continuation of depression is another argument for removing these molars upper jaw may very well affect the mood and perceived well-being of the young adult and adolescent. As a rule, there are no local complaints, such as pain, resulting from impaction, which could explain higher depression scores. The significant results in this study are restricted to the *upper* jaw, as far as depression is concerned. Earlier theorists also restricted the description of effects to the upper jaw (Voll, 1977[18]; Adler, 1983[1]; Sollman, 1971[15]).

The present study offers no explanation for this phenomenon, which would require further neurological research.

The lateralisation effect (the presence and position of impacted molars on the left side seems to go together with higher scores on depression and suicidal thoughts, especially in girls) is as yet unreported in the literature. Nevertheless, Sollman (1971)[15] describes a *'more aggressive*' outcome of disturbances in the left jaw. Further research seems to be warranted, in this respect.

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