Dental anxiety and behavioural problems: what is their influence on the treatment plan?

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**ABSTRACT. Aim** This was to investigate the influence of emotional and behavioural problems on the choice of treatment type. In addition, the actual contents of the treatment of dentally fearful children was studied in an attempt to develop dental treatment protocols for children with such problems. **Methods** The parents of 265 children (144 girls, mean age 88.4 months, SD±34.2 months), referred to a centre for special dental care, were asked to complete the Child Behaviour Check List (CBCL) before their first appointment. The CBCL was used to assess behavioural problems. All selected children were dentally anxious (score ≥35 on the Children’s Fear Survey Schedule Dental Subscale, CFSS-DS). After treatment, the children’s records were analysed on treatment type and contents. **Results** The CBCL score was related to the type of treatment. Children treated with the aid of nitrous oxide sedation scored significantly higher on the CBCL than children treated with behavioural management or under intravenous anaesthesia (IVA). In the IVA group more surfaces were treated than in the other groups. The CBCL score was not related to the treatment contents (number of surfaces filled, amount of radiographs, sealants, stainless steel crowns or pulpotomies), the time spent on the child’s treatment or the number of sessions. **Conclusion** Dentally anxious children with behavioural problems as assessed by the CBCL have dental treatment (contents and length) comparable with that of dentally anxious children without those problems. However, anxious children with behavioural problems are more often treated with nitrous oxide sedation. Therefore, there seems to be an urgent need for access to nitrous oxide sedation for dentists working in special dentistry.

**Keywords**: Children, Dental anxiety, Behavioural problems, Sedation, Nitrous oxide.

**Introduction**
Dental anxiety is a common complex phenomenon in adults as well as in children. In the Dutch population about 6% of children have a high anxiety level and another 8% are at risk of becoming fearful [Ten Berge et al., 1998]. It is important for paediatric dentists to know more about the development of dental fear. Rachman [1977] described a pathway theory of the development of fear comprising three pathways: direct conditioning, modeling and information. In later research it was concluded that these three pathways are interactively related [King et al., 1998]. The direct pathway together with the modeling pathway were significantly related to the development of dental fear [Milgrom et al., 1995].

Dental anxiety can complicate the treatment of the child. On the other hand, it is clear that behavioural problems are not always based on dental fear. In a Swedish child population only 27% of the children who showed behavioural problems during treatment were dentally anxious. It was also found that 61% of the children who were anxious showed behavioural problems during dental treatment [Klingberg et al., 1994].

As dental anxiety is related, in general, to a history of earlier dental treatments, children suffering from dental anxiety are treated by graduated exposure, aiming at counter conditioning of their negative experiences. Past experiences need to be replaced by positive new dental ones, secondarily reducing their anticipatory anxiety [Freeman, 1985]. Paediatric dentists sometimes use additional medical support, when dental treatment causes too many stimuli for the child. How the treatment mode should be chosen depends on the anxiety level and/or the mental age of the child. However, when the child develops personality or psychological problems, these might interact with dental anxiety. In a study conducted in a Dutch population referred for dental anxiety to a secondary dental care centre, 25% of the children had psychological problems possibly needing extra atten-
The aim of this study, therefore, was to investigate the influence of emotional and behavioural problems on the choice of treatment type in a prospective study. Also the contents of the dental treatment of dentally fearful children were studied retrospectively in an attempt to develop dental treatment protocols for children with such problems.

Materials and methods

A total of 304 children between 4 and 11 years of age (mean age 88.4 months, SD±34.2) were randomly selected from the children referred to the centre for special dental care in Amsterdam (SBT) and treated between 1995 and 2000. They were part of a convenience sample, based on their anxiety score (35 or higher) as measured with the Child Fear Survey Schedule Dental Subscale (CFSS-DS) [Ten Berge, 1998]. From this group, 39 children were excluded for several different reasons, among which were a mental disability, only one or two check-up visits at SBT or records were not available for scoring. The records of a total of 265 children (144 girls) were used for analysis. All 265 children received treatment and check-ups at SBT. They were all referred to the centre because they were not cooperative enough to be treated by a general dental practitioner, due to fear and/or behavioural management problems. The parents of these children were asked to complete two questionnaires on behalf of their child before their first appointment: the Child Behaviour Check List (CBCL) and the Children’s Fear Survey Schedule Dental Subscale (CFSS-DS).

The CBCL is a questionnaire to assess behavioural and emotional problems [Achenbach, 1991]. It is divided into two subscales: an internalising scale and an externalising scale. Questions are about all kinds of situations a child might encounter. The behaviour or reaction of the child is important. The questions can be answered with: not true, true and very true. A score of 60 or higher is considered to show emotional and behavioural problems. In our group the mean score on the CBCL was 31.4 (SD±23.2).

The CFSS-DS was used to assess the child’s dental fear level. The validity of its structure has been proven to be sufficient in the Dutch population [Ten Berge et al., 2002]. The list consists of 15 items about medical and dental situations. The scale per item ranges from 1 (not fearful) to 5 (very fearful). Only children scoring 35 or higher on the CFSS-DS were considered fearful and selected. The mean score on the CFSS-DS was 48.0 (SD±9.0).

During the initial session the dentist talked to the parents and their child to assess his/her dental condition. Together with the parents, a treatment plan was made. At that stage, the dentist was unaware of the CFSS-DS and the CBCL scores of the child. Only the history, the behaviour of the child at the appointment or the actual treatment need could influence the dentist’s decision for the treatment plan.

After treatment at SBT, the dental records of the children were scored on a number of variables. First, the treatment variables of the number of surfaces filled, extractions, pulpotomies performed, preformed metal crowns placed, fissure sealants used, number of radiographs and use of rubber dam. Secondly, treatment mode was scored where there were three options available: behavioural management techniques with local analgesia, nitrous oxide sedation (RA) or use of intravenous anaesthesia (IVA) with Propofol®. Finally, treatment time and the number of sessions required at SBT were scored.

Statistical analysis. All data were implemented in the SPSS statistical program [Voekl and Gerber, 1999]. Pearson correlation coefficients, independent sample t-tests and one way ANOVA were used when appropriate. A significance level of <0.05 was used.

Results

The 265 children had a minimum of two sessions and a maximum of 16 sessions at SBT. They were treated in a mean of 7.1 sessions (SD±2.8) each, during which a mean amount of 9.0 surfaces (SD±6.9) were treated.

The CBCL score of the group varied between 0 and 137 (mean 31.4, SD±23.2). Pearson’s correlations and t-tests showed that the CBCL score was not related to any of the treatment variables, such as number of surfaces filled, amount of radiographs, sealants, preformed metal crowns or pulpotomies placed, the time spent on each child’s treatment or the number of sessions used. The CBCL score was related to the treatment mode. Children treated with RA sedation had significantly higher CBCL scores (mean 44.9, SD±28.9; F(2.261)=5.9; p<0.004) than children treated with behavioural management (mean 30.0, SD±21.3) or with IVA (mean 28.2, SD±26.0). Finally, the relation between the treatment mode and the other
variables was assessed. More surfaces were treated in the IVA group \( [F(2.261)=13.2, \ p<0.001; \ \text{mean} \ 16.2, \ \text{SD} \pm 14.3] \) than in the behavioural management group (mean 8.4, SD ± 6.6) or in the RA sedation group (mean 9.5, SD ± 6.5). Even if we excluded from the IVA group three subjects with extremely high number of treated surfaces, the difference was still statistically significant.

**Discussion**

It was found that children with a higher level of behavioural and emotional problems were treated more often with RA sedation than with IVA or with behavioural management techniques. This finding was not very surprising. Treatment supported by RA gives a relaxation which is known to reduce the level of fear [Veerkamp, 1994], and it may therefore also reduce the behavioural problems expected. The children are more relaxed and their fear reactions or uncooperativeness are reduced.

It needs to be emphasised that the dentists were unaware of the CBCL score of the child during the initial assessment session at the moment they decided which treatment mode to use. It may be that dentists chose RA sedation for a child at the initial session, because of the occurrence of behavioural problems during the first appointment or because of the expected children’s behaviour, as indicated by the history of the child [Ten Berge et al., 1999a]. If CBCL is assumed to be a valid instrument to assess behavioural and emotional problems, the dentist may indeed already notice some of the difficult behaviour at the first visit to the clinic.

An important finding concerns the choice for IVA. This does not seem to be based on the presence of emotional and behavioural problems. In fact, it was found that children treated with IVA had a higher number of total surfaces treated than the other children. This finding is partly supported by the results of an earlier study in which it appeared that two factors play an important role in the indication for IVA: treatment need and age [Carson and Freeman, 2001]. In a study conducted with highly anxious adult dental patients it was also found that patients treated with IVA had significantly more decayed teeth than patients treated with behavioural management and nitrous oxide [Aartman et al., 1999].

There was no difference in dental treatment planning, in terms of number of sessions and time, between anxious children with and without behavioural problems. At the SBT, all dentists are specifically trained in treating all children, including those with behavioural problems. Special attention is given to all of them in order to reach treatment goals and treatment did not seem to take longer for those with behavioural and emotional problems as assessed in this study.

A remark should be made about the behaviour of the children. Behavioural problems, as scored with the CBCL, are not directly related to the dental situation. The CBCL concerns the types of situations a child is likely to encounter. We must understand that the score of this list might not indicate the exact behaviour of the child in the dental situation, as the CBCL assesses the frequency of emotional and behavioural problems in general. Especially in the dental situation, it might be more important to know why or when a child is overly stimulated or not able to deal with the invasive nature of dental treatment.

However, in this study emotional and behavioural problems, as scored with the CBCL, did not lead to a different kind of treatment planning and treatment time. All children with dental fear in this study could be treated well. In the future, closer study on the sequence of events during dental treatment is needed to find out at which moment during treatment a high level of emotional and behavioural problems might interfere with treatment.

**Conclusion**

Dentally anxious children with behavioural problems have a similar treatment plan, in terms of the dental treatment performed and the time needed, as dentally anxious children without those problems. There is, however, a difference in the treatment mode: anxious children with high scores on the CBCL are more often treated with nitrous oxide sedation compared with behavioural management techniques or with intravenous anaesthesia. The decision to use intravenous anaesthesia was more frequently based on the dental need than on the child’s behaviour. This study underlines the requirement for medical support for dental treatment of secondary dental care patients. The use of preoperative questionnaires is questioned, especially in the dental situation, as it might be more important to know why or when a child is overly stimulated or not able to deal with the invasive nature of dental treatment.

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References


