Eruption of supernumerary permanent teeth in a sample of urban primary school population in Genoa, Italy

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**ABSTRACT.** **Aim** The aim of this epidemiological study was to describe the incidence and distribution of hyperdontia in the primary school population in Genoa (Italy) and to check its influence on the development of orthodontic problems in children. The collected data should also help to find out what is the best age range among children to direct a program for early diagnosis and prevention of malocclusion and oral diseases related to hyperdontia. **Methods** The participating children (total number 1577, 814 males and 763 females, between 6 and 10 years of age) chosen in 19 public primary schools in Genoa have been examined by the same specialist through year 2004. Erupted permanent teeth, presence, position and form of supernumerary teeth, malocclusion presence and class, presence of orthodontic devices, age and sex have been noted down for each child. **Results** The global percentage of hyperdontia was 0.38%, more frequent in males (0.49%) than in females (0.26%). The most common kind of supernumerary tooth was mesiodens (83%). A significant increase of hyperdontia prevalence (from 0.64% to 1.06%) was noticed in children 9 years old. The incidence of malocclusion among children presenting hyperdontia was 83.3%, while the global incidence of malocclusion was 40%. An orthodontic treatment had been planned and started for 20% of children presenting malocclusion. **Conclusion** The study has revealed an incidence of hyperdontia much more frequent in males than in females (2:1). The most common site of eruption of supernumerary teeth is maxillary anterior region. Hyperdontia is strictly related with dental malocclusion. The best age range to direct a program of early diagnosis and prevention of malocclusion and hyperdontia is 9 years old children. **KEYWORDS:** Dentinogenesis imperfecta, Dentine-enamel junction, Dentine-enamel bonding system.

**Introduction**

Hyperdontia is a dental anomaly often noticed by paediatric dentists [Ignelzi, Fields and Vann, 1989; Davis, 1987; Humerfelt, Hurlen and Humerfelt, 1987]. It is not only a problem of aesthetics but it primarily brings functional diseases to the young patient. The presence of a supernumerary tooth interferes with the normal development of the dental arches causing dental crowding [Primosch, 1981], malposition [Di Biase, 1971], delayed eruption [Mitchell and Bennett, 1992] or retention of permanent teeth. Less frequent problems related to unerupted supernumerary teeth are dentigerous cysts [Awary and Siar, 1989] and radicular resorption [Primosch 1981] of adjoining permanent teeth. The management of supernumerary teeth in paediatric patients involves specialists such as orthodontists and oral surgeons, but the general dentist has the most important duty: the earlier he gives diagnosis, the better the problem will be solved. Our aim was to describe the prevalence of hyperdontia in the paediatric population of Genoa (Italy) and to check its influence on dental arches development.

We especially focused on functional and orthodontic problems that could be caused or influenced by the presence of supernumerary teeth. We chose students of primary school in order to intercept as early as possible the presence of hyperdontia without the use of radiographs.

The results of the study should also point out the best range of age to direct a program of screening for early diagnosis and prevention in schools.

Finally we registered the presence of orthodontic devices in children with malocclusion, to check the impact that teeth and oral health have on families and general doctors in Genoa.
Materials and methods

Sample population. In order to be able to give a scientific purport to our epidemiological study, we chose a sample of children with different socio-economic and ethnic background attending public primary schools in Genoa. The project was approved by the Public School Health Service of Genoa and by the School Headmasters that helped in organization. Nineteen public primary schools of different quarters of Genoa were involved in the study. From each school that participated to the screening were randomised five classes (children from 6 to 10 years of age, 25 students per class) so that we expected to have a two thousand people sample. A written, informed consent was obtained from each child’s parents.

Oral examinations. All patient examinations took place in the surgery of their school, and were performed by the same specialist using portable artificial light and single-use mouth mirrors. The examiner noted down for each child age and sex, drew a drop of the erupted permanent teeth, registered the presence, form and position of supernumerary teeth, the molar and canine class and the presence of an orthodontic device.

Statistic evaluation. Data were entered in a computer and statistical analysis was performed using a database program (Windows Excel, Microsoft) using descriptive methods. We divided the participants into groups according to sex and age (boys/girls and 6-7-8-9-10 years of age) and focused on hyperdontia, malocclusion and orthodontic treatment. We chose a 95% IC and considered data in a binomial distribution.

Results

The study sample included 1577 children, 78% of the estimated initial sample.

First of all we considered the prevalence of hyperdontia in the whole sample, that resulted of 0.38% (6/1577). Considering IC 95%, we have 0.0053<p<0.0023. The most frequent site of eruption of supernumerary teeth was the maxillary anterior region, as 83% of cases (5/6) were mesiodens.

Considering boys and girls separately, the incidence of hyperdontia was quite different: 0.49% among boys (group B n=814) and 0.26% among girls (group G n=763) (Fig. 1).

Then we considered 5 groups, corresponding to age clusters. We noticed a significant increase in the prevalence of hyperdontia in group 3 and 4 (8 and 9 years old children). In group 1 (n=361) and 2 (n=366) the incidence of hyperdontia was 0%, whereas in group 3 (n=312) we registered 0.64% (2 cases of hyperdontia), in group 4 (n=281) 1.06% (3 cases) and in group 5 (n=257) 0.38% (1 case) (Fig. 2).

The global incidence of malocclusion resulted similar in boys and girls: 40.17% in males (327/814) and 39.58% in females (302/763) IC 95% 0.327<p<0.427 (Fig. 3).

The data about malocclusion have not the aim to study its real incidence, because we simply analysed molar and canine class in children who did not complete their permanent teething.

We just needed to have an idea of the general incidence to compare it with that in group H (hyperdontia n=6). In this group 5 children (83.3%) were affected by malocclusion IC 95% 0.017<p<1.649 (Fig. 4).

Considering malocclusion’s trend among the 5 groups of patients of different ages, 11% of students in group 1 presented orthodontic problems, 37% in group 2, 51% in group 3, 52% in group 4 and in group 5 58% (Fig. 5).
Discussion

The participation rate of 78% for clinical examination was considered satisfactory and all the groups (boys/girls, 6-7-8-9-10 years) were homogeneous and well represented. The prevalence of hyperdontia both in the whole sample and in groups B and G was according to percentage reported in other European studies [Humerfelt, Hurlen and Humerfelt, 1985; Davis, 1987]. Also the frequency of mesiodens that we found in our study corresponds to data reported in literature [Davis, 1987].

The significant increase in hyperdontia’s prevalence we registered in groups 3 and 4 is in our opinion due to complete eruption of maxillary anterior permanent teeth in 9 and 10 years old children. For the same reason in group 3 and 4 we could observe a higher prevalence of malocclusion than in groups 1 and 2. Also we considered 9 years old children as the best sample to be screened by the school doctors who want to intercept hyperdontia and malocclusion at early stage.

When we considered malocclusion in group H, we registered 40% more children presenting orthodontic problems than in the whole sample. So we can state that hyperdontia has an important influence on the development of dental arches.

The data collected about orthodontic treatment in children presenting malocclusion (only 20% of them were treated) revealed that most parents do not consider orthodontics as an important part of oral health’s care.

Conclusions

The results of this study pointed out that hyperdontia has a significant impact on the correct
development of dental arches and functional dental occlusion. Its prevalence is higher in boys than in girls and 9 years old children represent the best sample to be screened for an effective early diagnosis of it.

The importance of a functional dental occlusion on children’s health has to be explained and emphasized to general doctors and families, and preventive programmes about oral health and malocclusion are needed in public schools.

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