Malocclusion as a Handicap

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There is no generally accepted epidemiological method for assessing the prevalence of malocclusion, even though there exists an awareness of the magnitude of the problem. The results of published surveys vary from a high of eighty percent to a low of twenty.[1-19] This variance relates not only to the actual prevalence, but to the methodology and criteria for assessing the handicap. The Expert Committee of the World Health Organization notes that, "few of the results are comparable owing to the differences in terminology and in diagnostic criteria and to the varying methods employed in examination and in reporting data".[19] The WHO has proposed an epidemiological method for assessing malocclusion which is based on whether the dentofacial anomaly is or will be handicapping to the degree that treatment is justified. The WHO proposal states: "An anomaly should be regarded as requiring treatment if the disfigurement or functional defect is or is likely to be an obstacle to the patient's physical and emotional well being".

In the study reported here, the prevalence of malocclusion detected by the WHO method of assessment allows one to investigate the following positive hypotheses: 1) The prevalence of malocclusion in a Caucasian population group assessed by an epidemiological method[19] should approximate one out of four children needing orthodontic treatment.[10] 2) The WHO method of assessment appears to be a positive step toward the development of true global dental epidemiology of malocclusion.

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Materials and Methods

A sample of 367 boys, ages nine to eleven, was examined. These boys came from five schools in the South Island of New Zealand and were from a uniform ethnic stock, primarily New Zealand born European. The subjects were well nourished and received regular dental care. This investigation was confined to the boys in the mixed dentition, as this was the time when developing handicaps could be detected.

The population group was assessed twice (each time by the WHO method and the same examiner) to check for a statistically significant error of measurement. There was a ten week interval between the examination and re-examination of the subjects. All examination records were assigned numbers for random assessment of 100 in each age group.

Results and Discussion

The prevalence of handicapping malocclusion in 300 randomly selected boys for age specific groups of one hundred each at nine, ten and eleven years of age was 19, 16 and 18 per cent respectively.

Although a simple precise measurement of handicapping malocclusion was difficult without bringing in some aspects of subjective judgment, the prevalence of this problem in this population group compares favorably with the international estimate that one of every four Caucasian children has an orthodontic problem that requires treatment. This South Island project was substantiated by the follow-up examination ten weeks later and there was no

statistically significant ($P = 0.05$) error of measurement.

All subjects diagnosed to have malocclusion were not necessarily handicapped to the extent that orthodontic treatment was needed, but as human variation was normal, it was inevitable that there would be deviations great enough to be classified as handicapping.

Malocclusion as a Handicap

The task of differential diagnosis, in which a variety of clinical manifestations were assessed, required that the epidemiologist be aware not only of the three classical anatomical dimensions in which distortions can occur, but also of the fourth dimension — *Time*. The mixed dentition of a ten year-old New Zealand school child could appear acceptable at that age-specific moment of examination, but the same child could later develop a disfigured permanent dentition. During the time required for this process there could also become evident such anomalies as malformed teeth, periodontal disease, and improper muscle function. Handicapping deviations in the dentition should, therefore, be considered in relation to the variety of clinical manifestations proposed by the WHO assessment criteria.

Certainly, the criteria for determining prevalence was not one of identifying malrelationships of the teeth and jaws which were accompanied by severe facial deformities, but rather one of determining when the minor deviations and borderline situations were significant enough to have been classified as esthetically unacceptable and severe enough to justify treatment. It was unlikely that this diagnostic phase could be replaced by more exacting measures within the forseeable future. Furthermore, a precise measure of the impact of malocclusion in personality development and mental health would be beyond the attainment of a biostatistically based parameter for objective qualitative measurement as long as the individual retains his powers of rationalization and the good sense and ability to adjust to minor imperfections.

In view of its complexity, when seen in a global scale, it seems that past accomplishments should be carefully analyzed and some additional time and effort now devoted to the development of a common language for epidemiologists all over the world. The WHO method of assessment is a positive step forward, but for the long range future there should be a continuation of improvement and testing of internationally standardized c r i t e r i a, indices and examiners.

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REFERENCES

1. Altemus, L. A.: Frequency of the incidence of malocclusion in American Negro children aged twelve to sixteen, *Angle Orthodont.*, 29: 189, 1959
2. Ast, D. B., and Carlos, J. P.: The prevalence and characteristics of malocclusion among senior high school students in upstate New York, *Am. J. Ortho.*, 51: 437, 1965
3. Calisti, L. J. P., Cohen, M. M., and Fales, M. H.: Correlation between malocclusion, oral habits and socioeconomic level of preschool children, *J. Dent. Research*, 39: 450, 1960
4. Dockrell, R. B., Clinch, L. M., and Scott, J. H.: The faces, jaws and teeth of Aran Island children, *Trans. European Ortho. Soc.*, 159: 220, 1954
5. Draker, H. L.: Handicapping labiolingual deviations: a proposed index for public health purposes, *Am. J. Ortho.*, 46: 295, 1960
6. Hertel, A.: Contribution a l'etude de la frequence des anomalies dentofaciales, *Trans. European Ortho. Soc.*, 251: 67, 1955
7. Hill, I. N., Blayney, J. R., and Wolf, W.: The Evanston dental caries study. XIX. Prevalence of malocclusion of children in a fluoridated and central area, *J. Dent. Research*, 38: 782, 1959
8. Knutson, J.: Orthodontics as a health service, *J. Am. Dent. Assoc.*, 70: 1205, 1964

9. Krogman, W. M.: The problem of 'timing' in facial growth, with special reference to the period of the changing dentition, *Am. J. Ortho.*, 37: 253, 1951
10. Lundstrom, A.: *Introduction to Orthodontics*, McGraw Hill, New York, 1960
11. Massler, M. and Frankel, J. M.: Prevalence of malocclusion in children aged 14 to 18 years, *Am. J. Ortho.*, 37: 751, 1951
12. Moore, G. R.: Orthodontic program of the Michigan State Department of Health with a new classification of occlusion for survey purposes, *Am. J. Ortho.*, 34: 355, 1948
13. Newman, G. V.: The Eskimo's dentofacial complex. Effects of environment and genetic factors, *U.S. Armed Forces Med. J.*, 3: 1953, 1952
14. Newman G. V.: Prevalence of malocclusion in children six to fourteen years of age and treatment in preventable cases, *J.A.D.A.*, 52: 566, 1956
15. Sclare, R.: Orthodontics and school children, *Brit. Dent J.*, 79: 278, 1945
16. Shiere, F. R. and Manly, R. S.: The effect of the changing dentition on masticatory function, *J. Dent. Research*, 31: 526, 1952
17. Telle, E.: A study of the frequency of malocclusion in the country of Hedmark, Norway. A preliminary report, *Trans. European Ortho. Soc.*, 192: 98, 1951
18. Van Kirk, L. E., Jr. and Pernell, E. H.: Assessment of malocclusion in population groups, *Am. J. Public Health*, 49: 157, 1959
19. World Health Organization: Expert Committee on standardization of reporting dental diseases and conditions, *World Health Organization, Tech. Rep. Ser.*, 242, 1962