

TIME OF ERUPTION OF PERMANENT TEETH IN BRITISH CHILDREN AT INDEPENDENT, RURAL, AND URBAN SCHOOLS

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In 1953 an account was given of the time of eruption of permanent teeth in a sample of schoolchildren from Birmingham between the ages of 5 and 13 years (Clements, Davies-Thomas, and Pickett, 1953). The dental observations were made in the course of the Birmingham Anthropometric Survey between 1947 and 1948, when children attending urban elementary schools were examined. Between 1949 and 1952 the survey was extended to include boys and girls in grammar and technical schools in Birmingham and independent and rural schools within a 30-mile radius of the city. Children at urban elementary schools between the ages of 14 and 15 years were also examined. By this means schoolchildren up to the age of 19 years and of very varied background were included in the survey population.

This paper provides an account of the times at which the permanent teeth of children attending different types of school erupt. Children from independent schools form a sample whose economic background is particularly good. Those from rural elementary schools are of mixed economic background; their comparison with children at urban elementary schools gives an indication of the effect of rural as opposed to urban life on the age of eruption.

Method and Material

A full description of the methods of examination, the preparation of the records, and the technique of analysis were given in the earlier paper (Clements *et al.*, 1953).

Previous analysis has shown that there is no significant difference in the eruption times of teeth on the right and

left sides of the jaw (Clements *et al.*, 1953). The statistics have therefore been computed from data relating to the right side only throughout.

Table I gives the total number of boys and girls examined at each type of school for each year of age. The numbers of children examined at independent schools in each age group are not large, particularly in the girls' sample, and it was not possible to obtain estimated eruption times for all teeth.

The samples of children from grammar and technical schools have been combined with those of the 14- and 15-year-old children at urban elementary schools, for none contain sufficient numbers to be considered alone. They do not include any children below the age of 11 years.

Results

The following abbreviations have been used: I₁ for the central incisor, I₂ for the lateral incisor, C for the canine, Pm₁ for the first premolar, Pm₂ for the second premolar, M₁ for the first molar, M₂ for the second molar, and M₃ for the third molar tooth.

Mean Eruption Times in Different Types of School

Table II gives the mean time at which the permanent teeth erupt for boys and girls separately in the three school groups. The mean eruption times previously computed for children at urban elementary schools are also included. Estimates of the eruption times of each tooth except M₂ can be given only in the rural elementary school group. The age range of the urban group lies outside the age at which I₁, I₂, and M₁ erupt, while the small numbers in the independent school sample are responsible for gaps in the table here.

Comparison of Mean Eruption Times in Different Types of School

Table III provides a comparison of the mean eruption times of the teeth of children in the three school groups examined here and also those of children at the urban elementary schools previously visited. Differences at the 1% and 5% level of probability have been indicated.

Differences between the two purely urban groups are of doubtful significance, for small numbers are involved. The children at rural elementary schools show a trend, most marked in the boys' sample, towards an earlier mean age of eruption than occurs in urban elementary schools.

The teeth of boys at independent schools also show a relatively constant trend towards earlier eruption times than are found in those of children at urban elementary schools, although upper and lower M₂ are an exception to this. Only two estimates of eruption times can be made from the girls' data; both are earlier in the independent-school sample, but neither is significantly so.

In the previous study of children at elementary schools a comparison was made between the eruption times of the teeth of children whose parents were in professional or managerial occupations with those whose parents were skilled or unskilled workers (Clements *et al.*, 1953). This showed a very consistent trend towards earlier eruption in the first group, but the numbers involved were small and no significant differences arose between mean eruption times of individual teeth, although the mean differences over all the teeth was 3.36 ± 1.13 months. It is therefore interesting that the tendency towards earlier eruption found in the teeth of these children is also evident in the teeth of children at independent schools, whose socio-economic background may be regarded as at its most favourable.

There are no significant differences between the mean eruption times of the teeth within the three school groups latterly visited. No consistent trends between them are obvious, although this may be due to the small numbers involved.

Although the general tendency is towards earlier eruption in children at these schools, the mean eruption time of M₂ is exceptional. In the upper and lower jaws of boys in each

TABLE I.—Number of Children at Each Type of School For Each Year of Age

Age Group (Years)	Boys			Girls		
	Independent	Rural Elementary	Grammar, Technical, and Urban Elementary	Independent	Rural Elementary	Grammar, Technical, and Urban Elementary
5- ..	—	39	—	—	34	—
6- ..	—	39	—	3	24	—
7- ..	3	36	—	4	38	—
8- ..	13	36	—	6	33	—
9- ..	20	36	—	6	39	—
10- ..	18	30	—	8	38	—
11- ..	19	29	28	16	35	6
12- ..	17	24	49	10	27	16
13- ..	23	21	96	9	23	71
14- ..	19	17	139	3	18	77
15- ..	15	6	159	4	3	151
16- ..	20	—	87	5	—	61
17- ..	18	—	47	8	—	20
18- ..	9	—	21	2	—	7
19- ..	—	—	4	1	—	—
Total ..	194	313	630	85	312	409

group, in the upper and lower jaws of girls in the mixed urban group, and in the upper jaw of girls in rural elementary schools this is later, although with one exception not significantly so, than in children at urban elementary schools. It has been suggested by Leslie (1951) that the time at which the milk teeth are shed affects the time of eruption of subsequent corresponding permanent teeth. This suggests that the second deciduous molar teeth, which are known to be particularly subject to caries (Mellanby and Mellanby, 1950), have been kept longer by children at these schools.

Discussion

The 1947-8 sample of children at elementary schools who form the basis of the previous Birmingham Anthropometric Survey report (Clements *et al.*, 1953) was more representative of the child population as a whole than is the sample of children analysed in the present paper. The latter, however, serve to confirm tendencies apparent in the earlier data and may throw some light on the factors involved.

The mean eruption times of the permanent teeth of the children at elementary schools first examined tended to be earlier than those given by other authors, most of which were the result of dental surveys made some years ago. This, taken in conjunction with the well-marked trend towards earlier eruption in children from a rural and from a superior socio-economic environment indicated in the results

of the present analysis, corresponds to the trends towards earlier development shown by overall body growth.

An apparent reversal of this tendency in the case of the second molar teeth may be a consequence of the susceptibility of the milk molars to decay. It may be assumed that the more satisfactory the nutritional conditions, the longer will these teeth be kept. As the time of eruption of the permanent teeth is influenced by the time at which the milk teeth are shed, this will lead to later eruption of the permanent molars by children living in better conditions.

Summary

The mean times at which the permanent teeth erupt are given for children attending three groups of schools. These are (a) independent schools, (b) rural elementary schools, and (c) urban grammar, technical, and elementary schools, the latter including children aged 14 and 15 years only.

The eruption times of the teeth of children at these schools is compared with those of children previously examined at urban elementary schools.

The permanent teeth of children at independent and rural elementary schools tend to erupt earlier than do those of children at urban elementary schools.

TABLE II.—Mean Eruption Times in Months with Standard Errors of the Permanent Teeth of Boys and Girls at Different Types of School

Tooth	Boys				Girls			
	Independent	Rural Elementary	Grammar, Technical, and Urban Elementary (Aged 14-15 Years)	Urban Elementary (Aged 5-13 Years)	Independent	Rural Elementary	Grammar, Technical, and Urban Elementary (Aged 14-15 Years)	Urban Elementary (Aged 5-13 Years)
<i>Upper Jaw</i>								
I ₁	—	81.27 ± 1.32	—	84.13 ± 0.71	—	84.94 ± 2.11	—	79.46 ± 0.57
I ₂	93.35 ± 7.39	96.46 ± 2.02	—	98.17 ± 0.74	—	96.91 ± 1.94	—	93.80 ± 0.87
C	123.08 ± 2.73	126.18 ± 2.27	127.38 ± 11.65	137.56 ± 0.92	—	127.86 ± 1.88	125.08 ± 18.86	128.07 ± 0.85
Pm ₁	—	120.73 ± 2.20	132.06 ± 3.00	124.96 ± 1.12	—	118.76 ± 2.19	—	117.45 ± 0.84
Pm ₂	126.44 ± 3.35	128.54 ± 1.83	135.06 ± 3.19	138.22 ± 1.13	—	125.72 ± 1.72	—	132.76 ± 1.17
M ₁	—	73.14 ± 1.69	—	73.29 ± 0.78	—	75.03 ± 3.07	—	71.25 ± 0.77
M ₂	144.92 ± 3.72	143.78 ± 2.57	147.09 ± 1.84	143.67 ± 0.94	—	141.87 ± 2.88	143.85 ± 2.40	137.94 ± 0.88
<i>Lower Jaw</i>								
I ₁	—	71.88 ± 1.38	—	72.96 ± 0.72	—	73.47 ± 2.43	—	69.22 ± 0.57
I ₂	—	85.34 ± 1.81	—	87.63 ± 0.71	—	85.40 ± 2.33	—	84.17 ± 0.70
C	121.30 ± 3.36	124.35 ± 1.46	128.62 ± 4.17	126.16 ± 0.80	—	109.76 ± 2.38	—	112.90 ± 0.74
Pm ₁	129.39 ± 2.73	124.88 ± 1.95	123.29 ± 13.52	136.20 ± 0.99	—	120.17 ± 1.92	—	126.33 ± 0.94
Pm ₂	136.26 ± 3.10	136.13 ± 2.30	136.18 ± 5.70	147.87 ± 1.17	131.31 ± 5.74	135.73 ± 2.50	141.69 ± 2.81	139.62 ± 1.17
M ₁	—	71.53 ± 1.43	—	73.69 ± 0.79	—	72.02 ± 1.64	—	70.08 ± 0.67
M ₂	140.37 ± 3.32	138.02 ± 1.95	138.59 ± 3.23	136.87 ± 0.84	132.46 ± 1.06	131.44 ± 1.88	139.96 ± 3.38	134.15 ± 0.89
M ₃	—	—	236.50 ± 11.56	—	—	—	—	—

TABLE III.—Difference, with Standard Errors, between the Mean Eruption Times in Months of the Teeth of Boys and Girls at Urban Elementary Schools and at Other Types of School

Tooth	Boys			Girls		
	Urban Elementary Minus			Urban Elementary Minus		
	Independent	Rural Elementary	Grammar, Technical, and Elementary	Independent	Rural Elementary	Grammar, Technical, and Elementary
<i>Upper Jaw</i>						
I ₁	—	2.86 ± 1.50	—	—	-5.48 ± 2.19*	—
I ₂	4.82 ± 7.43	1.71 ± 2.15	—	—	-3.11 ± 2.13	—
C	14.48 ± 2.88†	11.38 ± 2.45†	10.18 ± 11.69	—	0.21 ± 2.06	2.99 ± 18.88
Pm ₁	—	4.23 ± 2.47	-7.10 ± 3.20*	—	-1.31 ± 2.35	—
Pm ₂	11.78 ± 3.54†	9.68 ± 2.15†	3.16 ± 3.38	—	7.04 ± 2.08†	—
M ₁	—	0.15 ± 1.86	—	—	-3.78 ± 3.17	—
M ₂	-1.25 ± 3.84	-0.11 ± 2.74	-3.42 ± 2.07	—	-3.93 ± 3.01	-5.91 ± 2.56*
<i>Lower Jaw</i>						
I ₁	—	1.08 ± 1.56	—	—	-4.25 ± 2.50	—
I ₂	—	2.29 ± 1.94	—	—	-1.23 ± 2.43	—
C	4.86 ± 3.45	1.81 ± 1.66	-2.46 ± 4.25	—	3.14 ± 2.49	—
Pm ₁	6.81 ± 2.90*	11.32 ± 2.19†	12.91 ± 13.56	—	6.16 ± 2.14†	—
Pm ₂	11.61 ± 3.31†	11.74 ± 2.58†	11.69 ± 5.82*	8.31 ± 5.86	3.89 ± 2.76	-2.07 ± 3.04
M ₁	—	2.16 ± 1.63	—	—	-1.94 ± 1.77	—
M ₂	-3.50 ± 3.42	-1.15 ± 2.12	-1.72 ± 3.34	1.69 ± 1.38	2.71 ± 2.08	-5.81 ± 3.50

* Probability of less than 5%. † Probability of less than 1%.

The mean eruption time of M_2 shows a reversal of this tendency. It is suggested that this is due to the susceptibility of the milk molars to caries and their consequent earlier loss in less favourable conditions.

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ATTEMPTED SUICIDE WITH MEPROBAMATE TREATED WITH LEPTAZOL

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Meprobamate (2-methyl-2-N-propyl-1,3-propanediol dicarbamate; "miltown"; "equanil") was synthesized by Ludwig and Piech in 1950, and is widely used as a tranquillizer in the treatment of anxiety states and other psychoneurotic disorders. It has received wide acclaim as a most promising and relatively non-toxic drug offering many advantages over the usual sedative preparations prescribed in the treatment of these conditions. As there are few reported instances of meprobamate overdosage, we describe the following case, and draw particular attention to the effective therapeutic response to leptazol.

Case Report

A 30-year-old man, weighing 103 lb. (46.7 kg.) was admitted to hospital in coma. He had attended the outpatient department some days prior to admission, where meprobamate, two 400-mg. tablets four times daily, had been prescribed for an anxiety neurosis. He had, however, taken two tablets every four hours for a period of three days, and finally on the night before admission had ingested 20 tablets (8 g.) as a single dose. The following morning he was found unconscious in his room and was admitted to hospital.

Examination revealed a poorly developed comatose man insensitive to stimuli. Respirations were shallow at 20 a minute, pulse rate 84 a minute, axillary temperature 97° F. (36.1° C.), and blood pressure 80/60 mm. Hg. Other findings of particular interest were marked flaccidity of all limbs and an inability to elicit any tendon reflexes. He appeared to be in a state of hibernation combined with muscle relaxation and profound depression of the central nervous system. Gastric lavage was performed and an intravenous infusion of 5% glucose in saline instituted; at the same time it was decided to administer an intravenous injection of leptazol as an antidote to meprobamate. The effect of leptazol was dramatic. Within a minute of injecting 3 ml. the patient regained consciousness and responded to questioning although still drowsy, and he was able to give a relatively clear account of events leading up to his ingestion of the excessive dose of meprobamate the previous day. An examination of the nervous system 10 minutes after the

restoration of consciousness revealed extremely brisk tendon reflexes. His blood pressure had risen to 90/60 mm. Hg, and he complained of feeling intensely cold. Progress from this stage was uneventful, and by the following morning he appeared to have made a complete recovery.

Discussion

In 1954 Berger published a detailed account of the pharmacological properties of meprobamate. It produces a reversible flaccid paralysis of skeletal muscle with the abolition of tendon reflexes. Smaller doses produce muscle relaxations and sedation, without the stimulating effect common to most sedative drugs. Meprobamate, like mephensin, acts on the central nervous system as an interneuronal blocking agent, but is more effective and better tolerated than the latter.

When administered in the usual dose of one to six 400-mg. tablets daily, it is generally regarded as being an extremely safe drug. Selling (1955), in the study of 187 patients, described certain minor adverse effects. The first patient had two fainting attacks and fever of 102° F. (38.9° C.) following the administration of two tablets. A second developed urticaria after four days' treatment. Angioneurotic oedema developed in a third, and five patients complained of gastric discomfort. Selling describes two cases of meprobamate overdosage. One patient ingested 20 g. over a 24-hour period, became extremely sleepy, and developed a bradycardia of 40 a minute. The patient was made to walk about, and hot coffee was given in an attempt to keep her awake. She finally slept soundly for a period of 10 hours. Another patient consumed 40 g. of meprobamate within 24 hours and suffered no ill effects.

In his article Bergèr reported that meprobamate protected animals from E.C.T. seizures, and appeared to act as an antagonist toward leptazol and strychnine-produced seizures, and we therefore decided in this instance to use leptazol as a specific antidote to meprobamate overdosage.

Meprobamate seems to be a most valuable drug with a potentially wide field of application in clinical medicine. Its uses are not confined to the treatment of anxiety states. The anticonvulsant action suggests further study in the treatment of epilepsy, and the rigidity of Parkinson's disease might also benefit from its muscle-relaxant effect. With the ever-widening field of application one must anticipate an increased incidence of overdosage. Here we suggest leptazol as a specific antidote to meprobamate overdosage.

Summary

A case is described of attempted suicide with meprobamate and a dramatic restoration to consciousness following the intravenous injection of leptazol. The literature is briefly discussed, and a wider application of tranquillizers is envisaged. It is suggested that leptazol be used as the antidote to meprobamate poisoning.

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Mr. JOHN WILSON, the Director of the British Empire Society for the Blind, who is himself blind, has recently returned from a 15,000-mile tour of British territories in the Mediterranean and West Africa. The society by working with governments, local organizations, and missions is endeavouring to reduce the prevalence of preventable blindness. Mr. Wilson writes in the society's news bulletin that "Detailed surveys have now confirmed the appalling fact that there are 400,000 blind people in Nigeria, Ghana, Sierra Leone, and Gambia." The society also aims at training blind people to work and earn their living, rather than beg for it, and encourages blind children to attend school.