EFFECT OF CHROMATES ON THE TEETH

A Comparative Report

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A DENTAL survey was made on 100 men employed in the chromate division of Diamond Alkali Company and the observations were compared with a similar number of Cleveland Clinic patients. The age range was comparable, the largest number of chromate workers falling in the 26 to 40 year old bracket, while the clinic group had the largest number in the 41 to 60 age group. The chromate group had no general complaints, while the patients in the clinic group had some systemic or oral disorder for which the dental inspection was requested.

In the chromate group, 79 reported or displayed evidence of irregular dental care. Such care had consisted primarily of extractions, as noted in the large number of missing teeth. Irregular professional care was noted in 55 of the 100 clinic patients.

In evaluating dental sepsis, x-ray evidence was a prime consideration. Teeth which showed periapical tissue change or excessive alveolar resorption extending beyond the middle half of the root of the tooth were classed as septic, and beyond conservative care.

In the chromate group a total of 30 (30 per cent) showed chronic dental sepsis, 17 per cent of which were diagnosed as chronic alveolar abscess; 10 per cent had severe periodontoclasia and 3 per cent displayed evidence of both conditions. Seventy per cent showed no definite chronic sepsis.

In the clinic group 58 per cent manifested conclusive indications of chronic dental focal infection. This might again be subdivided into 20 per cent with chronic alveolar abscess, 21 per cent having severe periodontoclasia and 8 per cent with both conditions. In the clinic group 42 per cent showed no evidence of chronic dental focal infection.

In the chromate group a total of 59 patients showed dental caries, of which 41 patients had widespread carious lesions while 18 had 2 or less. Twenty-four in this group revealed no dental caries. Seventeen were totally edentulous. In the clinic group 82 patients had dental caries and in 42 of these the condition was extensive. Seventeen of the patients had no dental caries. One was totally edentulous.

In the masticating function of the person under observation, the loss of one or more of the molar teeth (not considering the third molars), without replacement, was considered a deficiency. In the chromate group 74 showed evidence of masticating deficiency, as against 22 which were recorded as compensated. Four in this chromate group revealed normal masticating function without loss of any molar support.

In the clinic group, 80 revealed masticating deficiency. Ten were found to be adequately compensated, and another 10 possessed normal masticating function without loss of teeth. It should be added that 11 in this group had partial compensatory prosthesis in one or the other arch which had not, however, overcome the masticating deficiency in the opposite arch.

A study of the D.M.F. ratio (the relationship of decayed, missing teeth, and restorations [fillings]) revealed a ratio of 6 to 70 to 22 (table 1) from the chromate group which, interpreted, indicated that 6 of the group had more caries than missing teeth or restorations, 70 had a majority of missing teeth, while 22 had a majority of restorations (2 were not listed). In the clinic group 5 had a majority of caries, 44 a majority of missing teeth, while 57 had a majority of restorations. The age distribution of sepsis and caries in the two groups in shown in Table 2.

Summary

The clinic group had a higher incidence of dental caries (82 to 59), a higher incidence of masticating deficiency (80 to 74) and a lower incidence of masticatory compensation (10 to 22). This latter condition could be attributed to the higher occurrence of full dentures in the chromate group, which had the larger quotient of missing teeth (70 to 44).

The clinic group also showed a higher incidence of dental sepsis in comparison with the chromate group (58 to 30 per cent). Several factors might explain this situation. Clinic patients who had attempted conscientiously (higher incidence) to preserve teeth by restorations (51 to 22), manifested an increased pulpal mortality with complicating sepsis of those teeth. Abetting this conservative treatment, the factor of the greater number in the older age group of the clinic patients must be considered also. Furthermore, because of the disturbance caused by a situation in a group supposedly receiving more adequate dental service and having, paradoxically, a higher incidence of caries, sepsis and dental masticating deficiency, the clinic group was examined in comparison with the regular and irregular dental service groups (44 to 55). It was found that the clinic patients who were considered as having received regular dental service manifested 43 per cent of dental sepsis and 79 per cent of dental caries; those whose dental service had been irregular showed 70 per cent dental sepsis and 85 per cent dental caries.

Conclusion

From this comparative study, one cannot state that the added hazard of working conditions had increased the incidence of dental caries, sepsis or other oral manifestations for patients exposed to chromates. Persons who were inclined to have teeth removed, rather than repaired, actually had a lower incidence of dental caries and sepsis than a comparative group of clinic patients. In the latter group disposed to have teeth repaired there appeared to be an unduly high incidence of dental sepsis.

TABLE 1

COMPARATIVE DENTAL SURVEY

	Sepsis				Caries			Masticating Function			Personal Oral Care		Profes-sional Oral Care		Ratio
	None	Abscess	Pyorrhea	Both	None	Slight	Severe	Normal	Compen-sated	Deficient	Regular (Daily)	Irregular	Regular (Annual)	Irregular	Decay Missing Fillings
Chromate Exposed Group 100 Men	70	17	10	3	24	18	41 a	4	22	74	35	58 b	19	79 c	6:70:22
Clinic Group 100 Men	42	29	21	8	17	40	42	10	10	80	48	51 d	44	55 e	5:44:51

a—Edentulous patients not included in this count.

b—Seven not listed.

c—Two not listed.

d—One not listed.

e—One not listed.

TABLE 2

SEPSIS AND CARIES BY AGE

	15 to 25 Age Group	26 to 40 Age Group	41 to 60 Age Group	61+ Age Group
Chromate Group (Sepsis)	7 in group 3 sepsis	56 in group 16 sepsis	34 in group 7 sepsis	6 in group 3 sepsis
Clinic Group (Sepsis)	8 in group 3 sepsis	27 in group 15 sepsis	58 in group 37 sepsis	5 in group 3 sepsis
Chromate Group (Caries)	7 in group 7 caries	56 in group 38 caries	34 in group 13 caries	6 in group 2 caries
Clinic Group (Caries)	8 in group 7 caries	27 in group 24 caries	58 in group 45 caries	5 in group 4 caries

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