

The Science and Ethics of Water Fluoridation

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A statement concerning the ethics of water fluoridation was published in a recent issue of the *Journal of the Canadian Dental Association*.¹ The arguments presented in that paper did not constitute what we would consider a complete and systematic account of the scientific and moral issues involved. It is our contention that water fluoridation, by the very nature of the way it is administered, engenders a number of moral dilemmas that do not admit to any easy solution. In this paper, we attempt to elucidate the particular problems posed by this public health initiative, according to the principles of bioethics.

The Role of Bioethics

Whether or not water fluoridation reduces dental caries in child populations has been subject to considerable debate.^{2,3} This debate is scientific rather than moral in character and revolves around the validity of the evidence concerning the benefits of adding fluoride to community water supplies. However, even if it were universally accepted that water fluoridation is beneficial and the scientific evidence incontrovertible, it would still have a moral dimension. This moral status arises in the application of water fluoridation in health care policy and public health practice. Attitudes toward public health initiatives are of necessity shaped by values. Bioethics is the study of the moral, social and political problems that arise from biology and the life sciences, and that involve human well-being.⁴ Of particular relevance are the core values of autonomy, beneficence and truthfulness.

Beneficence and Autonomy

Beneficence denotes the practice of good deeds and signifies an obligation to benefit others or seek their good. How this principle is put into practice depends on whose notion of good is applied. Health policy-makers and professionals, in advocating for the addition of fluoride to drinking water, are making moral decisions about the

well-being of individuals and applying their own notions of good. If beneficent acts are to benefit the recipients of the actions, the basis for the goodness of the actions must lie in the values or preferences of autonomous, self-determining individuals. In practice, however, beneficent acts such as water fluoridation tend to be in conflict with autonomy. Since it is effectively impossible for individuals to opt out, fluoridation takes away the freedom to choose.

Advocates of water fluoridation argue that the benefits accruing to society through reductions in dental caries outweigh any harm to individual autonomy. Defenders of autonomy argue that fluoride is available from many sources, and so its benefits can be realized without violating the principle of autonomy. However, this presumes that everyone in society can access these alternative sources. The most vulnerable in society, it is countered, would surely miss out on the benefits of fluoride.¹

Therefore, considering the benefit that accrues to disadvantaged groups in society, advocates of fluoridation contend that water supplies should be fluoridated on the grounds that everyone, regardless of socioeconomic status, can benefit. The claim here is that water fluoridation promotes social equity. This solution still leaves the conflict of beneficence and autonomy unresolved. In fact, there appears to be no escape from this conflict of values, which would exist even if water fluoridation involved benefits and no risks. However, water fluoridation does involve risks, in the form of increases in the prevalence and severity of dental fluorosis. Moreover, as Coggon and Cooper⁵ indicate, those most likely to benefit from water fluoridation are not necessarily those placed at most risk. This complicates considerably any attempt to balance beneficence and autonomy.

Advocates of water fluoridation, in seeking to strike a balance between competing values, are attempting to reconcile irreconcilables: the demands of moral autonomy cannot be made compatible with what could be regarded as the involuntary medication of populations. This situation gives rise to the question of which values concerning the conflict

between beneficence and autonomy should inform decision making with respect to water fluoridation: those of health professionals or those of the community?

Truthfulness

An assessment of the ethics of water fluoridation must also take into account the moral issues surrounding scientific inquiry in order for health professionals to be justified in advising or compelling others how to act. This aspect pertains to the principle of truthfulness, whereby health professionals are obligated to tell their patients the truth,⁶ for one cannot influence the way others act without first being justified in one's own beliefs.

The conventional view is that policy-makers are presented with a clear moral choice when weighing the benefits and harms associated with water fluoridation. Historically this may have been the case. The original community trials of water fluoridation indicated a substantial effect.^{7,8} However, over the past 25 years there has been a marked reduction in rates of dental caries among children, such that the benefits of water fluoridation are no longer so clear. Although current studies indicate that water fluoridation continues to be beneficial, recent reviews have shown that the quality of the evidence provided by these studies is poor.⁹⁻¹¹ In addition, studies that are more methodologically sound indicate that differences in rates of dental decay between optimally fluoridated and nonfluoridated child populations are small in absolute terms.^{12,13} Canadian studies of fluoridated and nonfluoridated communities provide little systematic evidence regarding the benefits to children of water fluoridation.¹⁴⁻¹⁷ Moreover, studies of the benefits to adults are largely absent,⁹ and there is little evidence that water fluoridation has reduced social inequalities in dental health.¹⁰

Truthfulness entails a proper appraisal of the benefits and risks. Currently, the benefits of water fluoridation are exaggerated by the use of misleading measures of effect such as percent reductions. The risks are minimized by the characterization of dental fluorosis as a "cosmetic" problem. Yet a study of the psychosocial impact of fluorosis found that "10 to 17 year olds were able to recognize very mild and mild fluorosis and register changes in satisfaction with the colour and appearance of the teeth."¹⁸ The investigators also stated, "The most dramatic finding was that the strength of association of [fluorosis] score with psycho-behavioural impact was similar to that of overcrowding and overbite, both considered key occlusal traits driving the demand for orthodontic care." In the absence of a full account of benefits and risks, communities cannot make a properly informed decision whether or not to fluoridate, and if so at what level, on the basis of their own values regarding the balance of benefits and risks.

In the absence of comprehensive, high-quality evidence with respect to the benefits and risks of water fluoridation,

the moral status of advocacy for this practice is, at best, indeterminate, and could perhaps be considered immoral.

Conclusion

These scientific and moral issues must be addressed and resolved if policy and practice with respect to water fluoridation are to be considered ethically sound. Yet it is not clear that this work can be accomplished satisfactorily. The conventional view that the ethical dilemmas posed by water fluoridation can be resolved by balancing the benefits and harms actually begs the question, for it presumes that such a balance can be achieved. The preceding arguments indicate that this view needs to be replaced by a moral account showing an appreciation for the ineradicability of the conflict of values that water fluoridation engenders. They also raise the question of whose values should take precedence when decisions regarding water fluoridation are being made.

Ethically, it cannot be argued that past benefits, by themselves, justify continuing the practice of fluoridation. This position presumes the constancy of the environment in which policy decisions are made. Questions of public health policy are relative, not absolute, and different stages of human progress not only will have, but ought to have, different needs and different means of meeting those needs. Standards regarding the optimal level of fluoride in the water supply were developed on the basis of epidemiological data collected more than 50 years ago. There is a need for new guidelines for water fluoridation that are based on sound, up-to-date science and sound ethics. In this context, we would argue that sound ethics presupposes sound science. ♦

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The Science and Ethics of Water Fluoridation — A Response

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Although Drs. Cohen and Locker have used a different philosophical approach to address the issue of the ethics of water fluoridation, many of their observations are similar to our own. We agree that this is an important policy issue for organized dentistry; we agree that the current scientific literature is weak and that more high-quality scientific research needs to be carried out (although we would add that such research should include economic and socioeconomic parameters); and we agree that the moral dimensions of public policy issues are complex and not easily resolvable. Their conclusion that there is an unresolved conflict between beneficence and autonomy is accurate. Simply put, a considered good in the eyes of one member of society may be an infringement of the rights and freedoms of another. Value conflicts speak to the very nature of bioethics.

So what do we do? Right now in Canada there are communities with fluoridated water supplies and those without. Canadian society looks to the Canadian Dental Association (CDA) and the profession in general for guidance and leadership about issues that require their expert knowledge and interpretation. Cohen and Locker seem to suggest that the CDA should not take a position in favour of fluoridation. They claim that “the moral status of advocacy for this

practice is, at best, indeterminate, and could perhaps even be considered immoral.” We take exception to this claim. Even in the face of indeterminate evidence and conflicting abstract principles and values, the profession cannot avoid taking a position, especially given the fact that water fluoridation has traditionally been supported as an important public health measure. The necessary research will take time and the CDA has a responsibility to either support or call for change to the status quo while the evidence is being gathered. We all seem to agree that the CDA must not be intransigent and must support further research and policy review in light of any new and credible findings. As stewards of influential dental policy for Canadians, the CDA also has a responsibility to remain sensitive to social justice issues in dentistry. ♦

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