

Parenteral monofluorophosphate (MFP) is a more potent inducer of enamel fluorotic defects in neonatal hamster molars than sodium fluoride

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Abstrak

Supra-optimal intake of sodium fluoride (NaF) during early childhood results in formation of irreversible enamel defects. Monofluorophosphate (MFP) and NaF was considered as less toxic than NaF but equally cariostatic. We compared the potency of MFP and NaF to induce preeruptive sub-ameloblastic cysts and post-eruptive white spots and pits in developing hamster enamel. Hamster pups were injected subcutaneously with either NaF or MFP in equimolar doses of either 9 mg or 18 mg F/kg body weight. At 9 mg F/kg, MFP induced more but smaller sub-ameloblastic cysts with a collective cyst volume twice as large as that induced by NaF. Eight days after F injection, all F-injection groups had formed 4-6 white spots per molar, with an additional 2 pits per molar in the low MFP group. Twenty-eight days after injection, most white spots had turned into pits (5-6 per molar) and only the high MFP group still contained 2 white spots per molar. We conclude that parenterally applied MFP is more potent in inducing enamel defects than NaF. Most white spots formed turn into pits by functional use of the dentition. The higher potency of parenteral MFP may be associated with sustained elevated F levels in the enamel organ by enzymatic hydrolysis of MFP by alkaline phosphatase activity.