17. Fluoride in Serum

Introduction

Fluoride is used in the treatment of certain bone disorders and as a supplement by certain water treatment authorities. Industrial exposure occurs among workers in the fertiliser industry, where urinary levels are used to monitor the level of exposure.

1080 poison (sodium fluoroacetate) is an extremely toxic organic fluoro compound, with an estimated lethal dose in humans of approximately 50 mg. Acute toxicity can also occur through ingestion of fluoride salts such as sodium fluoride, which is used in insect poisons.

Sample requirements

Blood is collected into a 5 ml plain red topped Vacutainer or Venoject tube. The blood is allowed to clot in the laboratory, and the serum should be separated from the clot within 4 hours of collection.

Interpretation

<table>
<thead>
<tr>
<th>Normal reference range</th>
<th>0.3 - 2.2 µmol/l</th>
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<tbody>
<tr>
<td>On fluoride treatment</td>
<td>3.3 - 13.7 µmol/l</td>
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Normal serum fluoride levels depend on intake, which is mainly from drinking water and toothpaste. Blood levels will rise after anaesthesia with methoxyfluorine and after haemodialysis with fluoridated water. Chronic fluoride poisoning results in mottling of the teeth and crippling changes in the skeleton, largely as a result of calcification. Blood levels of fluoride are used to monitor therapeutic levels for patients treated with fluoride and in patients undergoing haemodialysis in fluoridated areas.