

# Four-Year Experience with Methotrexate Exposures

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## ABSTRACT

**Introduction:** Unintentional methotrexate (MTX) acute oral overdose is rarely reported.

**Methods:** We conducted a retrospective chart review of all human exposure calls (>150,000 charts) for MTX ingestions reported to our Poison Center during 2000–2003.

**Results:** Thirteen patients met the criteria. The average amount of MTX ingested was 13.03 mg (data from 7 cases), and the average patient age was 43 years (20 months to 80 years). No significant toxicities occurred.

**Discussion:** Although intravenous MTX toxicity can be severe, this does not appear to be a phenomenon associated with either acute unintentional or suicidal oral ingestion.

## BACKGROUND

Methotrexate (MTX), a folic acid analogue and antagonist, is used in the treatment of particular cancers, autoimmune diseases, placenta accrete and ectopic pregnancy. MTX interferes with the conversion of dihydrofolate to tetrahydrofolate, the primary carbon donor for purine and pyrimidine synthesis, by inhibiting dihydrofolate reductase. Consequently, DNA and RNA synthesis disrupts, particularly in rapidly proliferating cells, such as cancer or immune cells [1]. Unfortunately, the effects of MTX extend to otherwise healthy normal cells, resulting in toxicity.

Toxicity following intravenous (IV) MTX therapy can be life threatening. Respiratory, hepatic, renal, neurological and hematological organ systems may be adversely affected. Interstitial pneumonitis, stomatitis, esophagitis, gastrointestinal bleeding, hepatitis, renal insufficiency, ataxia, paraplegia, nerve palsies and pancytopenia are well described more commonly with chronic

toxicity [2]. Treatment with urinary alkalization and leucovorin rescue is usually necessary to salvage normal healthy cells after high-dose IV MTX therapy [3].

MTX toxicity and outcomes following acute oral overdose, unlike IV toxicity, is ill defined. In this case series, we attempt to describe the clinical manifestations following acute oral MTX ingestion.

## METHODS

We conducted a retrospective chart review of all human exposure calls (~150,000 charts) for MTX ingestions reported to our Poison Control Center (PCC) during the years 2000–2003. Inclusion criteria were any acute oral MTX ingestions in human beings, irrespective of age, referred to our PCC. Chart review was conducted using Crystal Reports (Visual Dot Lab Enterprise, WBM Software, Fresno, CA). The only exclusion criterion was the inability to meet the inclusion criteria.

**Keywords:** methotrexate, poisoning, toxicity, oral

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