

# ON ADMISSION PATTERN OF METABOLIC CHANGES IN METHANOL INTOXICATION AND PROGNOSTIC FACTORS

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## Abstract

**Objective:** There are methanol outbreaks and clusters where both epidemiological and clinical parameters are reported, but most reports are either smaller case series or they are in lack of detailed parameters such as the blood gas etc. In order to study the pattern of the metabolic changes from-and prognostic elements of methanol poisonings, we collected material from different areas where such data were available. That gave us the most comprehensive material ever presented where blood gas analysis were drawn on admission

**Methods:** The material was collected from two different outbreaks in Norway (1979 and 2002-2004), one outbreak in Estonia (2001), one in Tunisia (2003/2004), as well as material from one referral center in Iran (period in years). The inclusion criterions were: Patients admitted to hospital alive with a diagnosis of methanol poisoning, where diagnosis were obtained on admission by a history of toxic alcohol ingestion and metabolic acidosis/visual disturbance or later verified by a positive S-methanol. For most calculations, the patients were separated in three groups: Group I: Survivors without sequelae, Group II: Survivors with sequelae, Group III: The patients who died. Data included age, sex, coma presentation, serum potassium/creatinine, methanol level and blood gas analysis on admission. One-way Anova with Tukey was used to test for differences among two groups,  $\alpha=0.05$  considered as the level of significant.

**Results:** 304 methanol intoxicated cases were recorded and stratified into group I (162 cases), group II (65 cases) and group III (77 cases). The age range was 2.5-77 year and male to female ratio of 250:54. Coma on admission was present on 15 (9.4%), 25 (39.1%) and 60 (77.9%) among 3 groups respectively with median serum methanol (mM) 27.8 (Range 1-179), 60.8 (Range 8-158) and 56.5 (Range 2-199). In the same way median pH (range) was 7.21 (6.52-7.58), 7.17 (6.53-7.54) and 6.78 (6.34-7.29); median pCO<sub>2</sub> (kPa) (range) 3.3 (0.95-15.5), 2.7 (0.85-9.33) and 3.3 (0.36-21); median HCO<sub>3</sub><sup>-</sup> (mM) (range) 9.8 (2-41), 6.3 (1-42) and 4 (1-39); median base deficit (mM) (range) 17 (-16-30), 20 (-14-41) and 29 (-7-48).

The data were sufficiently close to the normal distribution for pH, pCO<sub>2</sub>, base excess and HCO<sub>3</sub> for the groups to be compared for pairwise group comparison: pH differed significantly between the groups: Between Group. I - II (p=0.002), between Group I - II and II - III (p<0.001). BE differed significantly between group I-III and II-III (p<0.001), but not between I-II. HCO<sub>3</sub>- differed between Gr I-III (p<0.001), but not between the other groups. pCO<sub>2</sub> differed significantly between Gr. I-III (p=0.046), Gr. II-III (p=0.044) and metOH differed significantly between Gr. I-III (p=0.001).

**Conclusion:** On admission metabolic changes can use to determine severity and predict methanol intoxication outcome. Prompt and aggressive treatments as same as hemodialysis/antidote therapy may prevent associated morbidity and mortality in severe cases.