

LETTER TO THE EDITOR

EFFECT OF ORGANIC AND INORGANIC MERCURY ON SERUM TOTAL AND PERCHLORIC ACID-SOLUBLE SIALIC ACIDS IN RATS

Sir,

(Received on July 30, 1992)

Sialic acids are acylated derivatives of neuraminic acid and exists as terminal components of the non-reducing end of carbohydrate chains of glycoproteins and glycolipids in mammals. Their implications in a variety of surface related vital cell functions in various tissues are well documented (1). In an earlier study, increased levels of serum total and perchloric acid (PCA)-soluble sialic acids were observed in acute toxicity of inorganic mercury (2). In this study, effects of organic mercury (methyl mercury) were noted.

Twentyone male albino rats weighing around 330 g were divided into 3 groups and fed *ad libitum* with staple diet and water. Group I (control) rats received a single dose of saline (1 ml/kg; 0.9% NaCl, i.p.); Gr. II received a single dose of LD₅₀ of HgCl₂ (6.8 mg/ml/kg, i.p.) while those of Gr. III an equivalent dose of mercury as CH₃HgCl. The animals were observed for 48 hours for mortality and blood from the live animals (5 animals died in Gr. II) was collected by cardiac puncture using ether anaesthesia. Serum was separated by keeping the samples initially at room temperature for 20 min and then at 4°C for 20 min followed by cold centrifugation at 2000 rpm. Preparation of the PCA filtrates from sera and the estimation of total and PCA soluble sialic acids by thiobarbituric acid reagent was performed as described elsewhere (3).

There was a significant rise in the levels of serum total sialic acids in the animals treated with Hg. The levels of serum PCA-soluble sialic acids increased significantly and the change in the levels were 339% and 231% in Hg and MeHg treated animals respectively (Table I). Though the release of inorganic mercury is known to be the major biotransformation pathway

TABLE I: The levels of serum total and PCA-soluble sialic acids on acute exposure to Mercury and Methylmercury in Rats (Figures in parenthesis indicate the number of observations and the results are expressed as Mean ± S.D.).

Group	Total sialic acids (as μmole/100 ml)	PCA-soluble sialic acids (as μmole/100 ml)
I (Control - 5)	223.50 ± 25.79	14.48 ± 2.11
II (Hg - 4)	288.37 ± 41.21*	63.58 ± 6.32***aa
III (MeHg - 5)	260.63 ± 35.25	47.93 ± 3.32***

*P < 0.05; ***P < 0.001 as compared to group I.
**P < 0.01 in comparison with Gr III.

available for MeHg in rats, a meagre contribution to the observed effects can be expected by Hg derived from MeHg since the biological half life of MeHg is quite longer (about 50 days) than that of Hg. Nevertheless induction of α₁-acid glycoprotein (a sialic acid containing glycoprotein soluble in PCA) by MeHg has been reported (4) inline with the contemplation. A significant difference was also observed between the two test groups (i.e. Hg and MeHg) as regards their serum levels of PCA-soluble sialic acid, though the animals of both the groups received equivalent doses of mercury. In short, mercury, both in organic and inorganic forms elevated the serum levels of total and PCA-soluble sialic acids; the effects being more pronounced with the inorganic form than the organic form of mercury.

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