Measurement of Serum Levels of Monocrotophos by HPLC in Human Self-Poisoning Cases

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Objective : Organophosphorus (OP) insecticide compounds have a wide variability in chemical structure and properties. Patients who ingest them may benefit from management protocols developed for individual compounds (1). This study was to ascertain the plasma levels of OP compound monocrotophos achieved in patients after admission for self poisoning and to see if it was still present in plasma 24 hours after admission. **Methods :** Monocrotophos was analysed in a Perkin Elmer Series 200 HPLC system with a 25 cm x 4.6mm, 5mm Supelco, Discovery HS C18 column. Flow rate was 1.0 ml/min. using 30% acetonitrile as mobile phase and detection at 200nm. EDTA plasma was extracted in acetonitrile prior to injection on the column. **Results :** Retention time for monocrotophos was 3.42 - 3.44 mins. A monocrotophos preparation bought locally, strength 36%, was used, in dilution, as the standard with an assumed concentration of 36 g/dL. Table 1 shows the approximate Monocrotophos plasma concentration in 11 young patients (median age 28 years); 2 female and 9 male; on the day of admission and 24 hours later. **Conclusions :** We found very high levels of monocrotophos on admission, with a rapid clearance from the circulation 24 hours later. This is consistent with its chemical properties, as a water soluble, dimethyl phosphoric acid ester (oxon). Its distribution is only in the extra-cellular fluid. These properties of monocrotophos may produce a characteristic manifestation of toxicity. **Reference :**

Eddleston M, Eyer P, Worek F, Mohamed F, Senarathna L et al. Differences between organophosphorus insecticides in human self-poisoning: a prospective cohort study. Lancet 2005; 366: 1452-1459.

Table 1: Monocrotophos plasma concentrations in patients on day of admission and 24 hours later

Patient Number	Day 1 Monocrotophos Estimated (µg/ml)	Day 2 Monocrotophos Estimated (µg/ml)
50	24.5	ND
41	69.5	ND
37	15.6	8.4
21	11.5	ND
25	38.1	NA
18	21.5	ND
40	64.5	20.7
24 NK	11.6	ND
26 NK	8.2	ND
11	ND	ND
48	46.1	6.7
N=11	Median 21.5 (range ND – 69.5)	Median ND (range ND – 20.7)

NK poison not known until detected in the HPLC system
ND not detectable value < 1.0 mg/ml
NA not analysed