دراسة الآثار الباثولوجية لبعض مبيدات القوارض

الجـزء الثانى

عن السموم سريعة المفعول ، كريميد ين وفوسفيد الزنك

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الملخص

تم تعريض الفئران والجزران المنزليةوالمشاركة لجرعات قاتلة وتحت قاتلـة من مركب الكريميدين وجرعات قاتلة من مركب فوسفيد الزنك لدراســـةالتغيرات الباثولوجية فى أنسجة هذه الحيوانات . وقد اظهرت النتائج أن مركب الكريميدين له تأثير علىالجهاز العصبى والقلب والكليتين مما أدى الى موت الحيوان فى خلال ساعات قليلة أما الحيواناتالتىتعرضت لجرعات تحت قاتلة من هذا المركب فقدتغلبت على السم وكانت التغيرات الباثولوجية ضـــئيلة . وبالنسبة لفوسفيد الزنك فيعتبر توقف عضلةالقلب نتيجة التسمم هو السبب المباشر لموت الحيوان فى ساعات قليلة بعد المعاملة .

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ON THE PATHOLOGIC EFFECTS OF SOME RODENTICIDES

PART II

THE QUICK ACTING POISONS, CRIMIDINE AND ZINK PHOSPHIDE

(With 5 Figures)

By

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SUMMARY

Crimidine caused a relatively rapid death when given in lethal doses. Before death, animals showed neurologic signs suggestive of significant toxic involvement of the central nervous system. Autopsy revealed severe generalized venous congestion most probably due to acute heart failure secondary to toxic myocardiosis and tubular necrosis of kidneys probably produced by the concentration of the poison in renal tubules.

All animals given sublethal dose of Crimidine recovered within few days with the occurrence of minimal histopathologic changes.

Zinc phosphide cuased very rapid death of all animals. The post-mortem picture was characterized by severe generalized venous congestion and dilated flabby heart. The most probable cause of death was acute heart failure.

MATERIAL AND METHODS

These were mentioned else where (OMAR *et al.*, under publication).

RESULTS

1. *Effect of lethal Dose of Crimidine :*

Twenty three out of the 25 treated animals died within 2-8 hours, and the other two died within 12-24 hours. Fifteen to thirty minutes after taking the poison, they showed severe irritability and convulsions sustained for 1-4 hours. These signs then diminished gradually and finally the animals got collapsed and died.

By general examination, the dead animals exhibited the picture of extended hind legs, bent fore legs, raised tail, mild opisthotonus, distended chest and reddish discolouration of the feet (Fig. 1). The lungs were grossly dark brown in colour and soft in consistency. Histologically, they revealed the picture of severe acute venous congestion (Fig. 2).

The heart was grossly the seat of dark brown areas alternating with pale brown ones. Microscopically, it showed cloudy swelling and acute venous congestion. Grossly, the liver showed multiple large areas of dark brown discolouration. Histologically, it revealed the picture of severe venous congestion and early postnecrotic changes. The spleen had the picture of acute venous congestion.

The kidneys were reddish brown and soft with yellowish streaks. The adrenals were yellowish at the periphery and dark brown at the centre. Histologically, the kidneys revealed the picture of foci of cortical necrosis and venous congestion, (Fig. 3). The brain had the picture of acute venous congestion, especially of meningeal vessels.

In case of the sublethal dose of Crimidine, no significant pathologic changes were found in various organs of treated animals.

II. *Effect of Zinc Phosphide :*

The animals died after 1-4 hours from taking the lethal dose of the poison. Before death, they appeared with a decreased activity and lastly became motionless and died. The dead animals were lying flat with flacid body and extended tail.

The lungs were grossly greyish black and firm. Microscopically, they showed the picture of acute venous congestion and interstitial haemorrhages (Fig. 4). The heart was pale yellow and flabby and revealed the histologic picture of cloudy swelling.

The liver and spleen were the seat of diffuse dark brown discoulouration, Histologically both organs showed severe venous congestion (Fig. 5).

The kidneys revealed the picture of venous congestion and cloudy swelling. The intestine showed the picture of chemical necrosis of its mucosa. The brain had severe venous congestion of the meningeal vessels.

DISCUSSION

The lethal dose of Crimidine killed 92% of treated animals within a variably short period while the other 8% tolerated the dose for 12-24 hours. Variation was found between different species of rodents in their tolerance to the poison. Thus, the Cairo spiny mouse proved to be the most sensitive, while the white bellied rat was the least sensitive. This variation was reported by MAHDI *et al.*, (1971).

The early and marked neurological signs observed on animals reflected a higher toxic effect of Crimidine on the central nervous system.

The chief histopathologic changes were severe generalized venous congestion and degenerations in parenchymatous organs, especially the liver and kidneys. The latter organ, in particular, showed foci of tubular necrosis, probably caused by the concentrated poison in renal tubules. The generalized venous congestion is most probably, a reflection of acute heart failure. The failure could be explained by the toxic myocardiosis observed.

Recovery of animals given sublethal dose of Crimidine was the rule. Thus, the animals tolerated the dose of the poison and the histopathologic changes were either minimal or completely absent.

Zinc phosphide killed the animals within a shorter period as compared with Crimidine. The absence of neurological signs excluded the involvement of the central nervous system as a cause of death. Acute and severe generalized venous congestion was the dominating pathologic picture due to acute heart failure, caused by toxic myocardiosis.

REFERENCES

Mahdi, A.H., Arafa, M.S. and Nasr, N.T. (1971), Crimidine as a rodenticide against the spiny mouse *Acomys chirinus*. *International Pest Control*. London, May and June 1971.

Omar, A.H., Helal, T.Y. Arafa, M.S., Salit, A.M. and Maher Ali, A. (under publication). On the pathologic Effects of some Rodenticides, Part I the Anticoagulant Racumin$_{57}$.

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Fig. 1.—Two rats killed by Crimidine. Note the characteristic appearance of animals.

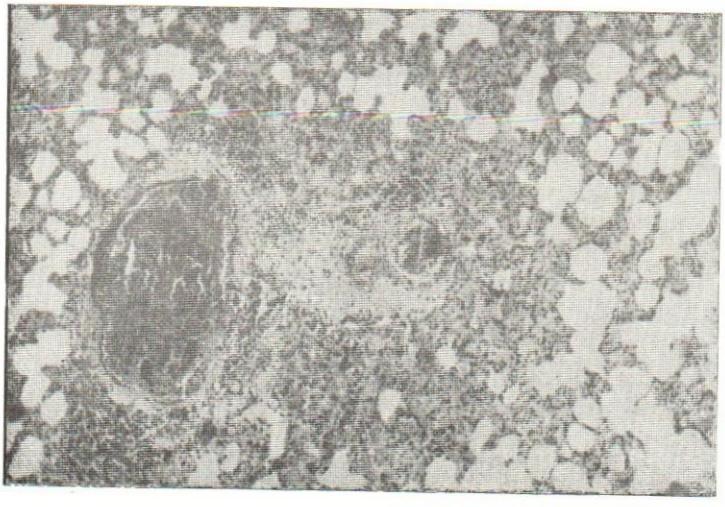

Fig. 2.—A microphotograph of a lung of the same case (H. and E. × 80.

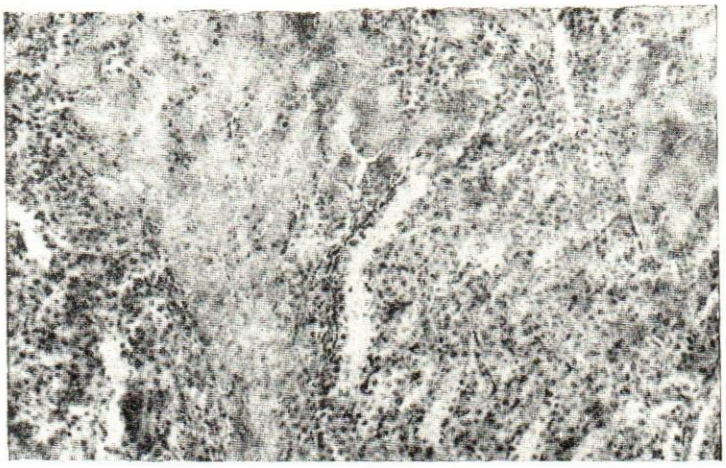

Fig. 3.—Tubular necrosis of rat's kidney after lethal dose of Crimidine (H. and E. × 80).

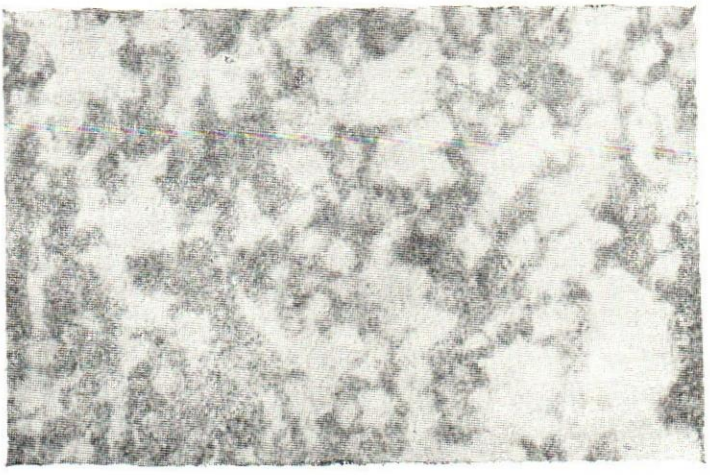

Fig. 4.—Histologic appearance of Rat's lung after lethal dose of Zinc phosphide (H. and E. × 80).

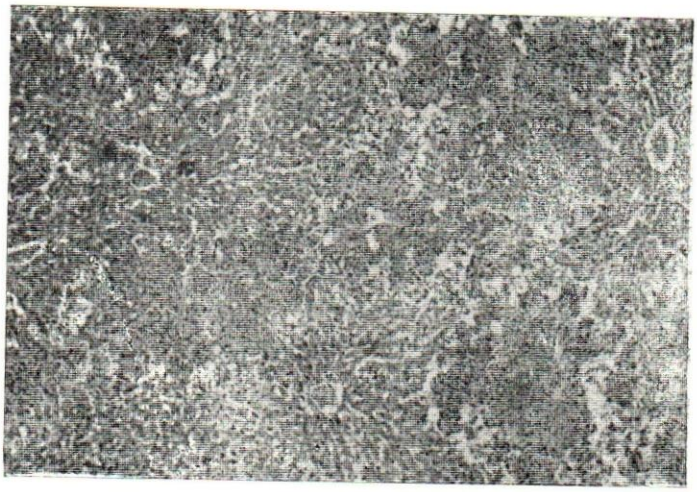

Fig. 5.—Severe venous congestion in a rat's liver after Zinc phosphide (H. and E. × 80).