

THE EFFICACY OF SELECTED CHELATOR OF LEAD IN DOGS: A MODEL FOR HUMANS

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Introduction

The ill effect of air pollution is not only limited to the presence of particulate matter but also the existence airborne heavy metals. Among the heavy metals that is of great concern is lead (Pb) which may lead to serious consequences to all life forms. Currently, the conventional chelators of Pb such as penicillamine and EDTA have undesirable side effects. Thus, the aim of the study carried out was to search for a new chelator of Pb with the following properties: Efficacious; safe; non-toxic; and cheap and easily available.

Materials and Methods

Eleven dogs were used to assess the changes in blood tissue Pb and the associated morphologic changes during haze. Three dogs each were assigned to the Pb, Pb+chelator (Pb+Ch), and Ch while the other two were treated as controls. The dose of Pb given was 5 mg/kg body weight and that of Ch was 10 mg/kg body weight. The experiment was conducted for a month. The dogs were kept in an enclosed confinement but housed in an open air situation. Blood and faeces were collected weekly for complete blood count and Pb determination. Post mortem was carried out on all dogs at the end of the experiment.

Results and Discussion

The clinical signs, concentration of Pb in tissues and morphologic changes in dogs from the control group were within normal limits. However, dogs in the Pb group exhibited clinical signs of Pb toxicosis, marked elevation of Pb concentration in tissues and morphologic changes associated with Pb induced injury. Dogs from the Pb+Ch and Ch groups did not show any clinical abnormalities, normal Pb concentration in tissues and less severe Pb induced morphologic changes. The absence of significant changes in the concentration of Pb in dogs from the control group appeared to contradict earlier findings during haze. The discrepancies could have arisen due to several factors. The latter study was conducted during haze in 1994. Coincidentally, during that year, unleaded petrol had just been introduced and thus its use was not widespread. The current study was conducted in 1997 (Noordin and Sheikh Omar, 1997) and the lack of effect of Pb in tissues of control dogs could have been due to widespread use of unleaded petrol. Likewise, public awareness with haze has probably lead to less activities being carried out and thus less use of vehicles. Nevertheless, the efficacy of the selected chelator has its own significance since it can be utilised to decrease body Pb burden. However, a thorough study is required to further refine the dose and frequency of the chelator to be used.

Conclusions

The findings from this study showed the levels of Pb in air has decreased possibly due to the use of unleaded petrol. The selected chelator used was found to be efficacious, specific, non-toxic and relatively cheap and easily available.

References

- Noordin, MM and Sheikh Omar, AR. 1997. Technical Report to the Haze Committee, Ministry of Science Technology and Environment, Malaysia. p. 3.