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THE EFFECTS OF ISONIAZID ON THE DIFFERENTIAL LEUCOCYTE CELLULARITY OF LACERTILIAN BLOOD

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ABSTRACT

Administration of 0.06 mg isoniazid (INH) per day for 5 days to *Uromastix hardwickii* showed adverse effects on the blood cellularity. It resulted in elevated number of neutrophils and eosinophils with very low count of lymphocytes. However, monocytes were less affected.

Key words: Isoniazid, differential cellularity, reptilian leucocytes, *Uromastix hardwickii*

INTRODUCTION

The incidence of adverse reactions to isoniazid (INH) was estimated to be 5.4 % among more than 2000 patients treated with INH. The most prominent of these reactions were 2 % rash, 1.2 % fever, 0.6 % jaundice and 0.2 per cent peripheral neuritis. Hypersensitivity to INH may result in fever, various skin eruptions, hepatitis, and morbilliform, maculopapular, purpuric, and urticarial rashes (Pitts, 1977). Leucocytes are found in the blood as they migrate from bone marrow to the tissues. In an individual the number is remarkably constant (Edwards *et al*., 1991; Metcalf, 1991; Athens, 1970; Athens *et al*., 1961a, b; Cartwright *et al*., 1965) showing only minor diurnal variation.

Vasculitis associated with antinuclear antibodies may appear during treatment but disappear when it is stopped (Rothfield etal., 1978). Hematological reactions, such as agranulocytosis, eosionophilia, thrombocytopenia and anemia may also occur (Craddock *et al*., 1960). Thus through the use of INH, an opportunity is accessible to study its effects on the differential cellularity of lacertilian blood.

MATERIALS AND METHODS

Experimental design

There were altogether 8 groups of 5 lizards each (Ahmad *et al*., 2003, 2004). Individual blood sample from the anterior abdominal vein of each lizard of each group was obtained prior to administration of 0.06 mg day^{-1} INH. Blood samples from the anterior abdominal vein of lizards belonging to 4 control and 4 test groups i.e. I, II, III, IV, V, VI, VII and VIII were collected on day 0, 1, 2, 3, 4 and 5.

Drug information

A detailed account of INH has been recently made by (Ahmad *et al*., 2003, 2004, 2005). The drug is rapidly absorbed from the intestine and is distributed through out the body. A dose of 0.06 mg day^{-1} of INH in syrup form was given to each lizard of II, IV, VI and VIII group for a period of 5 days.

Collection of blood

For various estimations of each individual; blood samples were infact necessary. For this purpose, required amount of blood from the anterior abdominal vein of each of the 5 animals of control and test group, was drawn separately on day 0 to day 5.

Changes in the differential cellularity

The staining of slides prior to differential counting was done according to Diagnostica Merck 11661. Hemacolor is a staining set for rapid manual staining of blood smears. It consists of a fixing solution, two buffered staining solutions along some buffer tablets. The staining pattern of the blood smear corresponds to classical staining

patterns, cell elements and structures being stained distinctly. Morphological alterations are thus easily recognized. The air-dried blood smear is fixed and stained by immersion into 3 solutions.

RESULTS AND DISCUSSION

Observations of control and test groups were compared and analyzed statistically by students t – test. Table 1 indicates that neutrophil count remained significantly higher ($P<0.05$) from day 1 to day 4 in test. Eosinophils showed elevated count from day 0 to day 5. However, monocytes showed a non significant low count in test while lymphocytes showed a significant low count ($P<0.05$) in test compared to controls. The relative role of different leucocytes in reptiles remains to be investigated. However, it is not difficult to say that what cellular elements are responsible for increased number of leucocytes on day 5 against continuous INH administration. Neutrophils protect the host against pyogenic infections. Their function is very closely related with that of lymphocytes and macrophages involved in the response to infection (Edwards *et al*., 1991). As Neutrophils are mainly phagocytic cells so that they engulf and destroy invading organisms. Some enzymes and substances are released by Neutrophils that affect the function of other cells called cytokines (Marcia, 2003). Neutrophils produce hydrogenperoxide to release myeloperoxidase into phagosome and release lysozyme. They remain in circulation for about 3 – 4 days (Edwards *et al*., 1991). Data indicated that they are higher in test than control.

Eosinophils are phagocytic and less active than neutrophils. They are hypersensitive to foreign proteins and help in containment of infections. Eosinophils causes vasocontriction, smooth muscle contraction, and an increased permeability of small blood vessels by releasing substances. Eosinophils are stimulated by parasites and some bacteria (Marcia, 2003). Data (Table 1) indicates their number in test is higher than control. Monocytes are motile and phagocytic, Monocytes recognizes gram negative bacteria and they have the capability to engulf and destroy microorganisms upon activation (Marcia, 2003), were less in tests than control and the lymphocytes with high nuclear to cytoplasmic ratio were also less in number in test than control.

Basophils which are stimulated by allergans, were not observed in any of the experimental animals. However, other workers (Zainulabedin *et al*., 1974) have reported that basophils are not present in more than half of the animal population.

Table 1. Changes in the differential cellularity of lacertilian blood following the administration of 0.06 mg day^{-1} isoniazid for 5 days.

Days after treatment	Per cent count							
	Neutrophils		Eosinophils		Monocytes		Lymphocytes	
	Control	Test	Control	Test	Control	Test	Control	Test
0	62	67	2	6	2	2	34	25
1	61	67	4	4	1	1	34	28
2	61	68	2	5	1	1	36	26
3	60	70	5	5	2	1	33	24
4	59	66	4	6	3	2	34	26
5	67	67	3	6	1	1	33	26

Each figure is the mean of 5 measurements.

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