

# CHANGES IN THE BLOOD URIC ACID CONCENTRATION IN DOGS IN THE POSTRESUSCITATION PERIOD

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UDC 616-036.882-08-07:616.633.857.5-074

The degree of changes in the blood uric acid concentration in animals resuscitated after clinical death, lasting for 1-2 min and developing after a prolonged period of agony, is closely connected with the severity of the course in the postresuscitation period and with the final outcome of resuscitation. By the 9th hour of the posthypoxic period the blood uric acid concentration of the dying animals was almost twice that in the surviving dogs.

The blood uric acid concentration is an important index of the state of metabolism in the body during shock and after massive blood loss [4, 6].

The object of the present investigation was accordingly to study the blood uric acid concentration during prolonged agony following blood loss and in the recovery period after clinical death in dogs as influenced by the outcome of resuscitation.

## EXPERIMENTAL METHOD AND RESULTS

Experiments were carried out on 13 dogs. The terminal state was reproduced experimentally by blood loss leading to hypotension (40 mm Hg) for 2 h. The animals were resuscitated after a period of clinical death lasting 1-2 min by Negovskii's method [2].

The serum uric acid concentration was determined by Einhorn's method [5]. Blood for testing was taken from the femoral artery at the following stages of the experiment: initially, after hypotension for 1-2 h, and 30 min and 3 and 9 h after resuscitation.

The results in Table 1 show that during hypotension, the blood uric acid concentration was increased to virtually the same degree in the surviving and dying animals. However, in the posthypoxic recovery

TABLE 1. Blood Uric Acid Concentration (in mg%) Following Lethal Blood Loss with Prolonged Hypotension and in Recovery Period after Clinical Death Lasting 1-2 Min in Surviving and Dying Animals ( $M \pm m$ )

Group of animals	Initial state	Hypotension		Recovery period after resuscitation		
		1 h	2 h	30 min	3 h	9 h
Surviving animals	$0,61 \pm 0,01$ (4)	$1,10 \pm 0,18$ (4)	$1,34 \pm 0,13$ (4)	$1,51 \pm 0,08$ (4)	$1,48 \pm 0,09$ (4)	$1,26 \pm 0,13$ (4)
p		<0,01	<0,001	<0,001	<0,001	<0,05
Dying animals	$0,60 \pm 0,04$ (9)	$1,21 \pm 0,12$ (9)	$1,74 \pm 0,22$ (9)	$1,90 \pm 0,18$ (8)	$1,97 \pm 0,24$ (7)	$2,38 \pm 0,24$ (5)
p		<0,01	<0,001	<0,001	<0,001	<0,001

Note. Number of animals given in parentheses. Significance of differences calculated relative to values in initial state.

Laboratory of Experimental Physiology of Resuscitation, Academy of Medical Sciences of the USSR, Moscow. (Presented by Academician of the Academy of Medical Sciences of the USSR N. A. Fedorov.) Translated from *Byulleten' Éksperimental'noi Biologii i Meditsiny*, Vol. 71, No. 2, pp. 42-44, February, 1971. Original article submitted July 10, 1970.

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period after clinical death, the difference between the uric acid levels differed significantly depending on the outcome of resuscitation. Whereas in the group of surviving animals the uric acid concentration reached a maximum 30 min after resuscitation and then began to fall, its concentration in animals which died after resuscitation increased progressively. By the 9th hour of the posthypoxic period, the blood uric acid concentration of these animals was almost twice as high as in the surviving dogs ( $P < 0.05$ ).

In animals in which the postresuscitation course was severe, the blood uric acid concentration was increased, indicating a predominance of metabolism in the body, not only during the terminal state, but also in the first few hours after resuscitation. The increased uric acid concentration in the body can be considered as arising from the breakdown of nucleoproteins and purine bases, the concentration of which is sharply reduced in the postresuscitation period [1, 7].

In dogs, uric acid is rapidly converted into allantoin [4, 6]. In the analysis of these results, the possibility of a disturbance of the processes concerned with the further oxidation of uric acid into allantoin, the end product of purine metabolism in dogs, must therefore be taken into consideration. This hypothesis is supported by results indicating a severe impairment of liver function after resuscitation when its outcome is unfavorable [1, 3]. Disturbance of renal function can also play an important role in the increase in the blood uric acid concentration in terminal states. Renal damage interferes with the excretion of uric acid from the body.

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