

SOME EXPERIMENTAL OBSERVATIONS ON PULMONARY EOSINOPHILIA

By

S. K. N. SINHA AND T. C. GUPTA

From the Department of Medicine and Department of Physiology, Darbhanga Medical College.

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Pulmonary eosinophilia is one of the commonest respiratory diseases in India and consists of a well defined group of cases in which high eosinophilic leucocytosis in blood is associated with pulmonary infiltrations radiologically. The other two constant characteristic features of this condition are specific response to organic arsenicals and the repeated failure to isolate any known aetiological agent capable of producing eosinophilia in blood. As usual where facts are few theories thrive. Various theories have been advanced towards the causation of this condition, though none of them have yet been proved.

Among various hypotheses there are also suggestions that the disease may be of various aetiology or due to spirochaetal infection (Frimodt-Moller and Barton, 1940; D'abrera and Stork, 1946) and may be communicable like similar other infections. The present work was undertaken to elucidate and to confirm or refute whether the blood or serum of patients contained any such agent which on injection in experimental animals could produce clinical features of respiratory catarrh associated with blood eosinophilia similar to pulmonary eosinophilia of human beings, and or could bring changes in the eosinophil counts of blood.

PLAN OF WORK

Guinea pigs were employed for the experiments. Firstly total W.B.C. and differential counts on blood obtained from cardiac puncture of healthy animals were performed and a mean normal found.

Five ml. of blood was then aseptically collected from acute cases of pulmonary eosinophilia by venepuncture and serum separated. This was diluted 1 in 20 with normal saline and then treated with 200,000 units of aqueous penicillin and 0.5g. of streptomycin. This was done to make the solution free from bacteria which might have entered as a contaminant (Misra and Hamid, 1953). About two ml. of this solution was injected in the animals intraperitoneally.

The animals were observed daily for signs of respiratory catarrh and total W.B.C. and differential counts were done on the third, fifth and tenth day after the inoculation.

RESULTS

Table 1 below shows sixteen normal counts done on healthy guinea pigs.

TABLE 1

No. of guinea pigs.	Total W.B.C.	Ploy. %	Lymph. %	Mono. %	Eosino. %	Baso. %
1	8,800	15	78	1	5	1
2	9,400	17	72	3	6	2
3	7,600	14	81	1	4	Nil.
4	7,400	18	76	2	4	Nil.
5	7,800	16	75	3	6	Nil.
6	6,200	14	75	4	7	Nil.
7	9,400	16	75	2	4	3
8	9,400	15	75	4	6	Nil.
9	7,000	18	71	4	6	1
10	8,000	17	76	2	5	Nil.
11	7,200	14	76	3	7	Nil.
12	7,600	15	78	1	6	Nil.
13	8,200	14	81	1	4	Nil.
14	8,400	16	74	4	6	Nil.
15	8,600	17	75	2	5	1
16	8,000	18	75	3	4	Nil.
Mean	8,062.5	15.87	75.8	2.5	5.3	0.5

Table 2 column 1 shows the normal count of a guinea pig immediately before the inoculation, Table 2 columns 2, 3, 4 show the counts done on the third, fifth and tenth day after the inoculation on the same guinea pig.

During the whole period of this experiment none of the animals showed any features of respiratory catarrh.

TABLE No. 2

Showing total W. B. C. and differential counts of guinea pigs before and after inoculation of serum from patients of Pulmonary Eosinophilia.

Guinea-pig No.	Initial Values			Values after inoculation																				
				3rd day.				5th day.				10th day.												
	Total W.B.C. Count	P %	L %	M %	E %	B %	Total W.B.C. Count	P %	L %	M %	E %	B %	Total W.B.C. Count	P %	L %	M %	E %	B %						
1	8200	14	78	3	5	..	8100	15	77	3	5	1	8000	15	75	4	6	..	7800	14	73	4	9	..
2	7500	17	73	4	6	..	7800	16	75	5	4	..	7800	17	76	2	5	..	7400	15	73	3	8	1
3	8000	16	76	4	4	..	8350	18	73	4	5	..	7900	17	72	3	6	2	7650	16	74	2	8	..
4	9250	15	78	2	3	2	9000	15	80	1	4	..	9000	16	75	4	4	1	8850	18	72	3	7	..
5	8800	19	74	1	6	..	8750	16	76	3	5	..	8600	18	72	2	7	1	8550	17	71	2	10	..
6	7650	18	76	3	2	1	7600	18	75	4	3	..	7450	16	74	5	3	2	7400	13	73	5	7	2
7	8450	17	75	2	4	2	8400	17	74	4	4	1	8400	19	71	3	7	..	8300	16	72	3	9	..
8	9400	16	73	4	7	..	9000	18	71	5	6	..	9100	16	74	4	6	..	9150	17	70	3	9	1
9	6800	15	78	1	5	1	6700	17	76	3	4	..	6700	15	77	2	6	..	6550	18	72	2	8	..
10	8300	13	81	2	4	..	8200	14	75	5	5	1	8250	17	75	3	5	..	8100	16	73	4	7	..
Mean	8245	16	76.2	2.6	4.2	0.6	8190	16.4	75.2	3.7	4.5		8120	16.8	74	3.2	5.5	0.6	7975	16	72.3	3.1	8.2	0.4

N. B. P- Polymorph, L- Lymphocyte, M- Monocyte, E- Eosinophil, B- Basophil.

A perusal of table 2 shows that :

(1) The total W.B.C. counts done on the third, fifth & tenth days after inoculation with serum from patients of pulmonary eosinophilia did not show any significant change from the count done immediately before inoculation.

(2) The differential W.B.C. count of normal healthy guinea pigs (column 1) shows an eosinophil percentage ranging from 2 per cent to 7 per cent with a mean average of 4.6 per cent. The differential counts done on the 3rd and fifth day after inoculation (columns 2 and 3) show no appreciable changes from the normal (column 1). The counts done on the tenth day after inoculation show a definite increase in the eosinophilic percentage of each guinea pig. The percentage now ranges from 7 per cent to 10 per cent with a mean average of 8.2 per cent.

SUMMARY

1. Total & differential counts of normal healthy guinea pigs were performed.
2. Total and differential counts done on third, fifth and tenth day after inoculation with serum from patients of pulmonary eosinophilia showed no change in the total counts but exhibited an increase in the eosinophilic counts only on the tenth day. This increase has not been considered statistically significant.

REFERENCES

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