SUMMARY AND CONCLUSIONS
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The present investigation was carried out to study the coal dust composition, particulate size of the particulate matter and their impact on the albino rats. For this, albino rats were exposed to coalliery atmosphere for 90 days.

Before the actual beginning of the experimental work, a rapid survey of population close to coalleries was carried out with respect to health spectrum of coal miners. Around Wani there are about 17 coal mines. The rapid survey of population near coal mines indicated that 24.0% of the people were suffering from common health problems such as respiratory, 16.4% from allergy, 2.4% from headache, 7.2% from anemia, 21.2% from immunosuppression and 3.2% from skin ulcers. Among the 24.0% population suffering from respiratory problems, breathlessness pneumoconiosis, cough, sputum, chronic obstructive airways were the major problems. Elevated body temperature was common in all the people surveyed.

Ambient air quality parameters at two different stations in Wani were studied. Particulate matter from coal dust was analysed for presence of any trace metals. Particulate size of coal particles was also measured. The coal dust from Wani coalleries was found to be rich in iron ions and the frequency of particulates ranging between 0 to 2 μ was quite high.

Water parameters of Wardha river water were carried out to know the
effect of coalliery drainage. pH, alkalinity, BOD, COD, Fe content were elevated and DO was found to be depleted because of coalliery drainage.

For experiments male and female albino rats were exposed to the actual coalliery atmosphere for 90 days.

The experimental and control rats were examined after 30, 60 and 90 days of exposure for change in their body weights, haematological, biochemical, pathological and immunological status. The significance level was tested at p < 0.1 and p< 0.01 level.

The haematological studies in experimental rats indicated depletion of RBC and Hb g %. Lymphocyte number was significantly increased. Neutrophils were decreased significantly in number after 90 days of exposure as they migrated to the interstitial spaces in tissues for phagocytosis. A : G (Albumin : Globulin) ratio was decreased significantly. There was significant elevation of γ- globulins-indicating lung toxicity.

Serum proteins depleted significantly and this depletion was positively exponential to duration of exposure. SGOT, SGPT, LDH, ALP, ACP were elevated significantly. Serum SOD was depleted. Serum potassium concentration was elevated along with simultaneous depletion of serum sodium ions. Serum Fe in experimental rats was significantly elevated.

Tissues like liver, Lung and kidney developed pathological condition with comparatively more damage to lungs. In T. S. of female rat lung, asbestos body was seen. The lung alveoli and interstitial spaces exhibited coal particles and leucocyte infiltration.

Tissue catalase was depleted significantly in all the tissues examined. Tissue LDH and GOT were significantly elevated either after 60 or 90 days of exposure.
Summary and Conclusions

Erythrocyte SOD and Na⁺K⁺ATPase were estimated and found depleted significantly in experimental rats.

Ig M were found to be the initial antibodies protecting the rats from coal dust. After 30 days the immune response is taken over by Ig G molecules.

Lymphocytes, macrophages and neutrophils are employed at places where particulate matter from coal dust enter in the tissues which upon activation might have secreted various cytokines during the immune response. The probable cytokine web is predicted from the present results and work carried out by earlier workers.