CONCLUSION
CONCLUSIONS

On the basis of this experimental study, which was carried out on the 164 Albino rats, in the animal research laboratory of M.L.R. Medical College, Jhansi, the following conclusions were drawn:

1. Bone infection can be produced experimentally in rats, 14 days after inoculation of pathogenic organism, directly in the bone.

2. Clinical features and course of bone infection in rats are very much similar to those of human beings but the time duration of their appearance, very in animals and in human beings.

3. After 14 days of bacterial inoculation, possibility of bone infection can not be ruled out on the bases of radiological examination only. Bone infection may be present when radiological signs are negative and the presence of infection in this condition can be proved by other investigations.

4. Radiological features of bone infection in rats are almost same as in human beings, but these changes appear earlier in rats than in the human beings.

5. In rats no evidence of reaction to bone cement was present radiologically, in a period of 14 days after its implantation in to the bone.
6. Pathological features are produced in bones of rats within 14 days of bacterial inoculation, in absence of splintage or support. Probably due to weight bearing on the pathologically weakened (infected) bone.

7. Mortality in rats is nil upto 14 days of inoculating the pathogenic organisms and implanting bone cement bead, in bones of these animals.

8. Macroscopic features of bone infection in rats are also very much similar to human beings.

9. Operative scar may be healthy, despite the infection of bone.

10. Cement bead may also be loose in the bone due to presence of bone infection, or necrosis of surrounding tissue.

11. Macroscopically no appreciable change is detected in set bone cement upto 14 days of its implantation in the bone.

12. Inoculated micro-organisms are found alive on culture upto 14 day even in the absence of macroscopic, microscopic or radiological changes in the bone.

13. All the rats (100%) retain inoculation pathogenic organisms in their bone upto 14 days, if plain bone cement (without incorporation of an antibiotic) was used.
14. Macrocopie or histopathological changes in bone may not correspond to bacteriological evidences of bone infection.

15. Contamination of sinus tract may occur, but had not reached to bone in 14 days.

16. Plain bone cement has no antimicrobial effect.

17. Water soluble antibiotic comes out at least upto 14 days when it is incorporated in bone cement.

18. An appreciable number of macroscopic features of bone infection are seen in rats, after 14 days of insulating the pathogenic organism in their bones.

19. A water soluble antibiotic, when incorporated in bone cement has a definite role in the prevention of bone infection (osteomyelitis).

20. Antibiotic impregnated bone cement is also effective in treatment of established bone infection.

Overall on the basis of the present study, we concluded that the use of water soluble antibiotic after incorporation in bone cement has a definite role in prevention of bone infection. Its use is safe and effective. It is also useful in treatment of infected bones, but it need further studies to find out the followings:

(1) What is the exact duration of effective antibacterial activity of an incorporated antibiotic in bone cement.
(ii) What is the minimum or maximum amount of an antibiotic which will provide its effective and safe local concentrations for a prolonged period.

(iii) What is the rate and pattern of antibiotic diffusion from antibiotic incorporated bone cement.

(iv) How much is the area of bone around the antibiotic impregnated bone cement bead, in which effective antibacterial concentration of incorporated antibiotic is found and for how long this antibiotic concentration is retained in the bone.

(v) Can incorporated antibiotic permeate through the scarred avascular or dead tissue including sequestra of infected bones.

(vi) What is the fate of antibiotic impregnated bone cement, if it is left inside the body.