6.0 SUMMARY AND CONCLUSION

- A total of 141 isolates of *P. aeruginosa* were recovered from human patients and confirmed on the basis of morphology, Gram’s staining and biochemical tests in our laboratory.

- The isolates were screened for their susceptibility to 26 different antibiotics belonging to nine antibiotic groups/classes namely aminoglycosides, carbapenems, cephalosporins, macrolides, monobactams, penicillins, glycopeptides, quinolones and tigecycline.

- A total of 69.50% (98/141) isolates were resistant to multiple antibiotics. 41.13% (58/141) were resistant to carbapenems. The MBL producing strains were detected phenotypically by combined disc test and Ezy MIC test and 46.55% (27/58) isolates were found positive for MBLs by the two methods.

- MIC values of carbapenems against one hundred *P. aeruginosa* isolates were determined by the Ezy MIC test.

- All the MBL positive isolates were characterized based on the amplification of selective MBL genes *bla*_{IMP-1} and *bla*_{VIM-2}, integron classes’ *int1*, *int2*, *int3* and sulphonamide resistance gene *sul1*. Amplification was achieved in 6 out of 27, 11 out of 27 and 14 out of 27 isolates respectively for *bla*_{VIM-2}, *int1* and *sul1* genes.

- The amplicons of *bla*_{VIM-2} gene of six isolates, *int1* and *sul1* genes of three isolates each were sequenced for their nucleotides.

- The VIM-2 producing isolates exhibited 99-100% homology to the standard VIM-2 sequences and 98% homology was observed in case of *int1* and 99% in case of *sul1*.

- Both the *bla*_{VIM-2} and *int1* genes were present in only one isolate, *bla*_{VIM-2} and *sul1* genes were present in two isolates and *int1* and *sul1* genes together were present in 9 isolates.
It may be concluded that multidrug resistant *P. aeruginosa* strains and MBL producing strains are prevalent in Himachal Pradesh. The frequency is quite alarming and requires redressal of the problem as such strains could result in spread of the resistant strains in hospital setting and community. Alternative therapies for treatment of *P. aeruginosa* infections can be explored. Regular monitoring of resistant strains is quite essential to the control programme.