Antibiotic discovery has open a new era in the treatment of post operative wound infection. Soon after the emergence of antibiotics, resistant strains were observed. Later half century has resulted an alarming increase in this phenomenon. In the present study, total 5810 cases of both gender and different age groups, selected from different general surgery ward were studied for the period from July 2008 to December 2011 (the “Study Period”). The patients were operated for various surgical procedures by different surgeons. All types of surgeries are included in study group whether emergency or elective, whether performed in main operation theatre or minor operation theatre, clean, potentially contaminated or even frankly infected cases were also included. Our study has justified the above statement. Our entire research work was carried out on the emergence of resistant strains in post operative wound infection scanning, identification and anti microbial susceptibility testing. The complete study was carried out on MicroScan autoSCAN4 (USA-FDA approved system) for organism identification to the species level & determining antimicrobial agent susceptibility in minimum inhibitory concentration (MIC) value. The post operative wound infection rate observed in study is 09.79%. The isolated microbial strains include *Staphylococcus* Spp., *Enterococcus* Spp., *E. coli*, *Klebsiella* Spp. *Pseudomonas* Spp. *Proteus* Spp., *Candida* Spp. and many others. Many of them are Methicillin Resistant *Staphylococcus aureus*, Extended Spectrum Beta-Lactamase producers & KPC carbapenemase producer strains. All of them were analyzed for antimicrobial susceptibility using around 30 routinely used antibiotics for treatment of infection. The alarming speed of acquiring resistance against antibiotics now suggests the proper usage of antibiotics.

**Keywords**: P.O.W.I., MicroScan autoSCAN4, MIC, M.R.S.A., ESBL, KPC

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