



Original Article

Antibiograms of Orthopedic Wound Discharge Bacteria Isolated from a tertiary care teaching hospital

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Abstracts

Diseases are inescapable in various orthopedic methods. Notwithstanding all aseptic precautionary measures, noteworthy postoperative bleakness, mortality, delayed healing center remain and expanded clinic costs are watched. These contaminations are generally caused by the exogenous or endogenous microorganisms that enter the injury site. Here, we discovered the basic living beings in orthopedic injury contaminations and furthermore played out the anti-infection affectability think about. This was an imminent report completed on 2510 patients who were admitted to the orthopedics wards amid the most recent 4 years. The injury swab and discharge release from orthopedic patients were sent to Microbiology division and with standard method the life forms were distinguished. At that point the anti-microbial affectability designs were done and basing upon the affectability design, anti-toxins were recommended. Staphylococcus aureus (675) was the most generally separated creature in this investigation. Aside from this, Pseudomonas aeruginosa (285), Klebsiella Sp. (270), Acinetobacter Sp. (220), Citrobacter (125), Proteus Sp. (85), E. coli (45) and sprouting yeast cells (35) were detached. In anti-microbial affectability design, it was discovered that S. aureus is increasingly touchy to Tigecycline. Anti-infection agents ought to be legitimately chosen and its planning of organization is additionally pivotal. So remembering every one of these parameters, conceivable odds of advancement of careful site contaminations and consequent anti-toxin opposition can be diminished to extraordinary degree, if not totally disposed of.

Keywords: Infection, orthopaedic surgery, surgical site infection.

Introduction

Surgical site diseases (SSI) are a standout amongst the most appalling and commonest difficulties of medical procedure what's more, causes huge postoperative horribleness, mortality, delays healing center remain, and increment clinic costs

moreover. These contaminations concern 2 million cases every year worldwide.¹ WHO portrayed Hospital gained contaminations as one of the major irresistible sicknesses having immense financial impact.² Nosocomial contaminations are critical issue all through the

world and range from 1% in Europe and America to over 40% in parts of Asia, Latin America and sub Saharan Africa.³ A wide assortment of high-impact and anaerobic types of microscopic organisms might be available, either independently or in blend. The most minimal contamination rate (under 2%) pursued clean activities, for example, elective orthopedic strategies, in which the conceivable wellsprings of pollution were exclusively airborne or exogenous. The situation of SSI is distinctive in orthopedic medical procedures as contrasted with different medical procedures as far as utilization of inserts, span of medical procedure and so on which are vital hazard factors that records to higher contamination rate in these medical procedures. This investigation was attempted to assess the normal microorganisms found in orthopedic wards and affectability example of those life forms. The microbiology of twisted contaminations in all careful administrations has changed next to no over the years.⁴⁻¹³ *Staphylococcus aureus* is the absolute generally normally experienced living being. Others incorporate oxygen consuming gram negative living beings, for example, *Escherichia Coli*, *Pseudomonas* species, *Proteus* species and *Enterococcus*. The overall rates of each differ from one doctor's facility concentrate to another.^{4-7,9,14,15} In Nigeria, Mbamali saw that 60% of his patients who had embed disease were contaminated by *Staphylococcus aureus*. Different living beings in that review were *Pseudomonas pyocyanea* and *Klebsiella* species. Onche⁴ in Lagos refined *Staphylococcus aureus* in 72% of instances of twisted contaminations in inserts while *Escherichia coli* and *Klebsiella* species represented 14% each. In Jos, North Central Nigeria, the image was somewhat extraordinary where Oguachuba¹⁶ found that in 41.9% of his injuries, *Proteus* species were refined while *Staphylococcus aureus* was 25.6%. Coliforms (13.9%), *Streptococcus* Sp., *Pseudomonas* sp. furthermore, *Klebsiella* were the other isolates.¹⁶ In this specific examination every single injury contamination were considered and not explicitly

in embed contaminations. Classen⁷ at Salt Lake City in USA detailed that of the 43 bacterial secludes from clean careful injuries including Orthopedics, *Staphylococcus aureus* was secluded in seven cases (16.3%); gram negative poles in six(14%); *Enterobacter cloacae* in five(11.6%); *Enterococcus* in five(11.6%) and *Klebsiella pneumoniae* in two (4.6%). They additionally discovered that the anaerobe, *Bacteroides fragilis* represented 14% of the diseases. Sanderson in Middlesex, England, discovered *Staphylococcus aureus* being in charge of 35% of post-agent twisted diseases in hip inserts, *Staphylococcus epidermidis* 15%, Coliforms 25% while anaerobes and anonymous others represented 25%. The motivation behind this report was along these lines to explain the example of bacteriological detaches, which are dependable for post-agent twisted contaminations to distinguish their antimicrobial affectability design in our condition.

Materials and Methods

In this imminent investigation of 4 years, every one of the patients admitted to the orthopedic wards of the doctor's facility were enlisted. Patients with diabetes mellitus, weight, carcinoma and patients on medications, for example, steroids or cytotoxics were avoided. Wound swab was taken from the compound breaks and post agent discharge release. Wounds were analyzed for contamination on the day of admission to the orthopedic wards, at release furthermore, ensuing follow-up visits at the outpatient facility. Any patient who created wound disease had his/her culture and affectability done. The documentation of disengaged life forms depended on the consequences of culture and affectability. Vigorous culture was done utilizing Nutrient, blood and chocolate agar on each contaminated injury example. The anti-microbial affectability designs were done with Mueller-Hinton agar. This was done at Department of microbiology, IMS and SUM Doctor's facility. All the disconnected microscopic organisms and anti-infection affectability design were report in both enroll and

PC. This information were factually investigated with SPSS 20 programming.

Result

Table 1: Number of bacteria isolated from Orthopaedic wound discharge.

S.No	Name of Bacteria	Number	Percentage
1	S. aureus	675	26.89
2	P. aeruginosa	285	11.35
3	Klebsiella Sp.	270	10.76
4	Acinetobacter Sp.	220	8.76
5	Citrobacter Sp.	125	4.98
6	Enterococci Sp.	100	3.98
7	Proteus Sp.	85	3.39
8	E. Coli	45	1.79
9	BYC	35	1.39
10	No growth	645	25.70
11	Contamination	25	1.00
	Total	2510	100.00

In this planned investigation, an aggregate of 2510 orthopedic wound examples were gathered for culture and anti-microbial affectability consider. Among them, 645 examples did not appear any development in culture medium. Aside from this 25 tests were observed to be defiled. These examples were rejected from this investigation. This examination uncovered 1805 microorganisms from the 2510 injury release tests. Staphylococcus aureus (26.89%) was the most usually disconnected living being in this investigation pursued by Pseudomonas aeruginosa (11.35%), Klebsiella Sp. (10.76%), Acinetobacter Sp. (8.76%), Citrobacter Sp. (4.98%), Proteus Sp. (3.39%) and E. coli (1.79%). Aside from this, sprouting yeast cells (1.39%) were disengaged (Table 1). In light of the standard rules it was seen that anti-infection agents are being recommended exactly without realizing their opposition design.

Such remedies can lead to an expansion in the anti-microbial obstruction. Consequently, regularly directed anti-microbials were screened for their adequacy. In the event of S.aureus, it was very safe to ceftriaxone (68.75%), where as it was slightest impervious to amoxycylav (3.93%). In spite of the fact that Piperacillin/tazobactam was favored as the main line medication of decision for P. aeruginosa, in any case, it was uncovered in this investigation that the obstruction example of this medication has expanded to 41.46% in view of indiscriminant use (Table 2). In the wake of concentrate the opposition example of the ordinarily endorsed anti-infection agents it was reasoned that numerous anti-microbials were being controlled despite the fact that their obstruction design had expanded. So anti-toxins having great affectability design (chose 5 anti-toxins) ought to be chosen for beginning use. The most touchy anti-infection agents were Amikacin, Tigecycline, Amoxycylav, netilmycin and vancomycin (Fig 1).

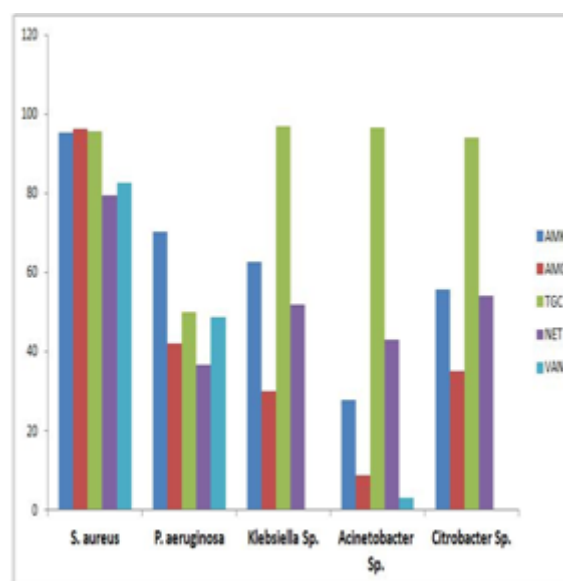


Fig 1 Sensitivity of antibiotics towards common organism isolated from the wound infections of orthopaedic department.

Table 2 Antibiotic resistance pattern of isolated bacteria from Orthopaedic wound discharge

Bacteria	AM K	AMC	CEF	NOR	PIT	LN Z	OFL	CTR	CFM	VA N	NET	IC	CF S	TG C	CX M	IM P	CIP	MRP	CFP
Acinetobacter Sp.	72.41	91.42	85	83.33	75.75	97	63.04	68	88	97	57	78.94	86.66	3.57	97	62.5	66.66	63.63	96
E. Coli	11.62	71.42	87.09	90.9	32.6	NA	44.04	28.88	82.35	97	16.66	88.09	96	2	91	20	92	NA	NA
Citrobacter Sp.	44.44	65.21	71.42	61.53	52.63	NA	54.76	36	70	NA	46.15	71.28	87.4	5.88	89	16.66	66.66	79.23	NA
S. aureus	4.78	3.93	68.75	NA	35.44	13.26	12.16	24.59	27.77	17.5	20.51	98	20	4.32	34.09	6.33	47.72	59.26	50
Enterococci Sp.	25	52.38	49.22	41.22	49.22	NA	35.71	66.66	66.66	42.85	5	66.66	98	2.56	NA	7.22	20.16	NA	NA
Klebsiella Sp.	37.5	70.21	63.33	63.33	53.33	NA	51.8	64.21	85.71	NA	48.22	65	92	3.18	97	17.07	75.22	94.32	NA
Pseudomonas aeruginosa	29.78	58.06	97	97	41.46	97	49.35	56.33	87.5	51.36	63.34	33.33	65	50	93	23.33	51.60	66.66	91.33
Proteus Sp.	46.15	71.42	62.5	66.66	9.09	NA	58.82	49.18	97	NA	83.33	28.57	19	12.5	NA	30	81.33	96.33	NA

Discussion

Wound contaminations not just represent an issue to the specialist be that as it may, to every one of the individuals who have a stake being taken care of by orthopedic and injury patients. It is related with expanded horribleness, cost of social insurance and on occasion can be catastrophic.² The microbiology of post-agent twisted disease in inserts has changed almost no finished time except¹³⁻¹⁵ for the development of safe creatures. Staphylococcus aureus was the most usually disconnected miniaturized scale creature in this examination representing 26.89%. It was likewise most normal in different reports around the world. The relative rates anyway shift from focus to focus. At the National Orthopedic Hospital Lagos, Onche⁴ discovered it represented 71.4% of his confines while in Zaria, North Central Nigeria, Mbamali⁶ secluded staphylococcus aureus in 60% of patients while Classen⁷ in USA noticed that it happened in 16.3% of their cases. The picture was anyway extraordinary at Jos where Oguachuba¹⁶ observed Proteus sp to be the most well-known disconnect with a rate of 41.9% pursued by Staphylococcus aureus with 25.6%. What is appropriate here is that at the Jos focus, the injury was unclassified. Other vital disengages in this examination were *E. coli* and Proteus species. Amikacin pursued by tigecycline were observed to be most powerful against Staphylococcus aureus. Customarily intense cephalosporins were profoundly opposed by it. This is in view of the

rise of exceptionally safe strains of Staphylococcus aureus in doctor's facility settings. Anti-toxins are still sold over the counter in pharmaceutical stores and by patent prescription sellers. The gram-negative oxygen consuming poles like *E. Coli*, Pseudomonas, Proteus and Klebsiella were observed to be delicate to Amikacin while basically impervious to the cephalosporins tried. This examination has featured three issues in the microbiology of orthopedic injury diseases. Initially, Staphylococcus aureus remains the most vital microorganism in charge of post-agent wound disease in inserts and prostheses. Besides, safe strains of creatures have risen furthermore, recently held medications have turned out to be first line in treatment of these diseases. Thirdly, anaerobic living beings stay essential confines where such societies are achievable. At last, remote site contaminations ought to be annihilated before attempted embed or prosthetic tasks.

Conclusion

The outcomes acquired from this examination have broad result regarding social insurance conveyance and financial status of person. Almost certainly, anti-toxins have been utilized exactly at the out arrangement of the the board of a patient having an injury either following injury or accompanying contamination, with no culture and affectability. This investigation, in addition tosses light on about touchy anti-toxin organization at

the start of such administration. This would be most fitting in lessening dreariness, mortality, delayed doctor's facility remain and expanded wellbeing care costs.

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