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Study of changing patterns of bacterial isolate in diabetic foot, after hospitalization

KEYWORDS: bacterial, diabetic foot,

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ABSTRACT *The study included 100 cases of Diabetic foot ulcer, admitted in Government Hospital during period of July 2010 - August 2012. After taking approval from our ethical committee, we started this prospective study. All the patients were asked in details about onset, duration and progression of the ulcers with associated symptoms of pain, discharge etc. The patient were asked about history of diabetes mellitus and later on investigated with blood sugar level. All patients having diabetic foot were included. Diabetic foot ulcers were common in 41 to 60 year age group suggesting that the productive members of the society are at higher risk. And diabetic foot ulcers were more common in male as compare to female. Majority of our patients were from lower socio economic class. Most of the patients had the habit of smoking and the condition was associated with HT and peripheral arteriopathy. The most common organism isolated initially is Staphylococci and streptococci, eventually replaced by Pseudomonas, and later on the most common one is Pseudomonas, E.coli, Klebsiella and Proteus.The overall most common bacteria isolated was Pseudomonas followed by Staphylococci. Staphylococcus Aurous and streptococci are most sensitive to Amoxycillin+clavulinic Acid, followed by Piperacillin and then followed by Ciprofloxacin and resistant to Azithromycin followed by Cefixime and Cefoperazone.*

Introduction:
Ulcer is a very common morbid condition. Its diagnosis mainly depends on Clinical Examination and supported by Investigations .Management of ulcers require persistence of both the patient and the surgeon. Every surgeon almost always encounters chronic or callous ulcers refusing to heal and such ulcers are the ultimate test of the patience of both the surgeon and the 'victim' (patient). Diabetic foot is one of the most common events in life of a diabetic patient and a major risk factor for subsequent extremity amputation. The prevention and treatment of lower extremity ulceration has been strongly correlated with reduced amputation rates. Thus To prevent this complication is highly desirable**. Evaluation of changing patterns of bacterial isolate in diabetic foot after hospitalization and their antibiotic sensitivity** is the most important step in diabetic foot management. This can guide clinician at every step during management and it can also help in formation of an antibiotic policy of health care setup. Based upon this thought, the following study was carried out**.**

Objective:
This prospective study was carried out to fulfill following objective

1. To study bacterial pattern in diabetic foot at the time of admission
2. To study the change in bacterial isolates after hospitalization due to various factors including the hospital environment itself.
3. To study the antibiotic sensitivity pattern.
4. To find out the resistant organism.
5. To make effort to find out possible solution for prevention of major complication including limb amputation in diabetic foot
6. To make guidelines for antibiotic policy.

Materials and methods:
The study included 100 cases of Diabetic foot ulcer, admitted in Government Hospital during period of July 2010 - August 2012. After taking approval from our ethical committee, we started this prospective study. All the patients were asked in details about onset, duration and progression of the ulcers with associated symptoms of pain, discharge etc. The patient were asked about history of diabetes mellitus and later on investigated with blood sugar level. All patients having diabetic foot were included. All the patients were asked in details about onset, duration and progression of the ulcers with associated symptoms of pain, discharge etc. The patient were asked about history of diabetes mellitus and later on investigated with blood sugar level. All patients having diabetic foot were included. Then we sent pus for culture and sensitivity test during first 24 hour of admission followed by pus for culture and sensitivity test every week.

Report is analyzed to see - Sensitivity and resistance pattern of organism to different antibiotic at time of admission and thereafter, according to that antibiotic given and their effect on wound and condition of patient was seen. Organisms which were prevalent at time of admission were noted and their after changes in organism pattern were also analyzed. Organisms which were most resistant to antibiotics were found out. Guideline for antibiotic policy was started being laid down at local level. (We have used only those antibiotic supplied by Guru Gobindsingh Government Hospital, Jamnagar)Ciprofloxacin, Levofloxacine,Norflxacin,amoxicillne+clavulanicacidPiperacillin,Amikacin,Gentamycin,Vancomycin,Cefaperazone,Cefixime,AzithromycinWe have included below mention bacteria in this study Staphylococci,Streptococci,Pseudomonas,E. coli,Klebsiella,Proteus

Observation and discussion:
age group of 41-50 years and 51-60 years contains maximum number of patients. Diabetic foot ulcer was less common in Children in our study. The prevalence in 4th decade can be attributed to the increased mobility and productive life while vasculopathy and neuropathy may have a role to play after 5th decade of life. Diabetic Foot Ulcer was present in 75% of male and 25% of female. Diabetic Foot Ulcer was more common in male than female. This probably due to bare foot or accident related trauma in male working outside the home. Majority of patients were from lower socio economic class about 90%, this indicates the role of poor hygiene, recurrent infection due to trauma, cross infection due to overcrowding, smoking related ischemia and overall poor nutrition in these types of patients. Patients with diabetic foot presented with

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ulcer (90%), swelling (10%), pain (72%) and gangrene (10%) at the involved site with or without fever. In some patients, examination revealed presence of crepitus in addition to the signs of inflammation. Patients had the habit of smoking (58%) hypertension (52%) peripheral arteriopathy (44%)

MOST COMMON ORGANISMS ISOLATED (WEEKWISE)

ORGANISM	3RD DAY	1ST WEEK	2ND WEEK	3RD WEEK	4TH WEEK
Staphylococci	46	28	-	-	-
Streptococci	10	6	-	-	-
Pseudomonas	-	30	38	32	6
E. coli	2	8	16	16	2
Klebsiella	-	-	4	4	2
Proteus	-	4	4	2	-

ANTIBIOTICS AND RESPECTIVE SENSITIVITY PATTERNS (out of 256 cultures)

	Staphylococci		Streptococci		Pseudomonas		E. Coli		Klebsiella		Proteus	
	S	R	S	R	S	R	S	R	S	R	S	R
Amoxicillin + clavulinic acid	83.7		62.7								60	
Ciprofloxacin	67.6		44.8		79.3	17.9	18.2	63.6	60		40	
Levofloxacine	48.3		28.6				43.2					
Piperacillin	60.8		79.6		98.1							
Amikacin	12.2		6.8		7.6	78.3	63.6			60		40
Gentamycin						97.2	63.6					60
Tobramycin						45.3						
Cefoperazone		44.1		45.6	41.5	16	6.8	59.1		20	20	10
Cefixime		51.9			5.7	23.6		60			30	20
Azithromycin	20.27	54.6	31.6	48.6				25		60		
Vancomycin	52.7		58.2									
Norfloxacin									60			
Gatifloxacin									40			

Conservative methods including dressing, with SSG sos and conservative amputations like toe amputation were sufficient for at least 50% of the patients. 34% of the total patients required more radical approach with below knee amputation. Majority of the patients stayed in the hospital for a period of 30-40 days followed by those staying for 20-30 days. This indicates that Diabetes can get complicated with an infected foot ulcer and results into a prolonged hospital stay. During the hospital stay a patient can have variety of interplay between his systemic and local factors

Conclusion:

Diabetes mellitus (DM) represents a disease in which high blood glucose levels over time can damage the nerves, kidneys, eyes, and blood vessels. Diabetes can also decrease the body's ability to fight infection. When diabetes is not well controlled, damage to the organs and impairment of the immune system is likely. Foot problems commonly develop in people with diabetes and can quickly become serious. Diabetic foot ulcers are commonly occurring due to trauma, ischemia or infection in a neuropathic or non-neuropathic foot. Serial examination of ulcer discharge or pus for its organism and antibiotic sensitivity of that organism is one of the most important tools in managing diabetic foot ulcer patients. A properly changed antibiotic and vigilantly followed antibiotic policy can bring down the rate of limb lost in such patients or it can certainly slow down it.

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