

MICROBIOLOGY OF MUSCULOSKELETAL SEPSIS



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1970 to 2008

MICROBIOLOGY

MUSCULO SKELETAL
BACTERIAL FLORA

Primary Haematogenous Infection in Children

Community acquired infections:

Staph aureus over 90%
Other gram positive cocci up to 10%
Haemophilus influenzae (up to 30 in
septic arthritis between 6/12 to 2 yrs)

Adult Bone Infections

Overwhelming majority of community
acquired infections still Gm+ve cocci
sensitive to Cloxacillin or Ampicillin
Gm-ve bacilli in immune compromise

In case of penicillin hypersensitivity
Cotrimoxazole, Clindamycin, Fucidin
are reliable alternatives

Erythromycin, tetracyclines and quinolones
effective but less potent

Other Primary Bone Infections

- TB very common but not in my practice
- Primary fungal bone infections very rare
(Mycetozoa Nocardia)

Trauma Infections

Gram positive cocci initially predominate after acute trauma and post-op infection

Most methicillin sensitive

Bacteria encountered (1994) during treatment of arthroplasty infection

Gram Positive	Pre & Intra-op	Postop
Staph aureus	46.5%	4.4%
Staph epidermidis	18.3%	8.9%
Other gram positive cocci	9.8%	13.0%
Enterococcus faecalis	5.6%	6.6%
	87.1%	39.7%
Gram Negative		
Coliforms	2.8%	10%
Other gram negatives	4.2%	50%
Anaerobes	5.6%	6.0%
	12.6	66%

BACTERIA FOUND INITIALLY IN 579 INFECTIONS AROUND KNEE & HIP ARTHROPLASTIES (1970-1997)

Methi Sensitive Staph A	23.8%
Methi Resistant Staph A	2.5%
Methi Sensitive Staph E	30.3%
Methi Resistant Staph E	4.4%
Other Streptococci	3.8%
Enterococcus	4.6%
Bacillus	4.4%
Anaerobes	<u>1.1%</u>
	74.9%

BACTERIA FOUND INITIALLY IN 579 INFECTIONS AROUND KNEE & HIP ARTHROPLASTIES (1970-1997)

GRAM NEGATIVE

E Coli	4.4%
Enterobacteria	2.5%
Klebsiella	5.3%
Proteus	3.3%
Pseudomonas	5.5%
Serratia	2.2%
Acinetobacter	<u>2.2%</u>
	25.4%

Hospital Infections

With longer stay in hospital the picture changes

MRSE and MRSA increase as do

Gram negative nosocomials

Further changes in bacterial population inevitably occur in response to treatment with appropriate or inappropriate antibiotics

AT FIRST OPERATION

Gram positive	73.8%
Anaerobes	1.1%
Gram negative	25.4%

AT SECOND OPERATION

Gram positive	47.5%
Anaerobes	5%
Gram negative	47.5%

NEGATIVE CULTURES

	HIPS	KNEES
Pre-op	34%	41.7%
1 st Op	23%	12.3%
Post 1 st	68%	53.6%
2 nd Op	62%	52.4%
Post 2 nd	72%	62.5%
Final Cure	90%	71.0%

POSITIVE CULTURES - KNEES

	1 ST Op	Postop	2 nd Op	Postop 2
Gm +ve	75.5%	28.2%	47.5%	38.5%
Gm -ve	22.5%	29.6%	47.5%	35.9%
Anaerobic	1%	0	5%	2.6%
Fungi	0	1.4%	0	2.6%
Contam +ve	2%	19.7%	0	5.1%
Contam -ve	0	21.1%	0	15.4%

Secondary Fungi

- Mostly Yeasts
- C Albicans C Parapsilosis C Tropicalis
- Contaminate irrigation fluid

POST-OP CULTURES

All negative	61.3%
Same as Pre-op	5.3%
Same + New	17.3%
New Only	16.0%

MILPARK MRSA SCREENING ON ADMISSION MAY AND JUNE 2008

	MAY	JUNE
MRSA	5	4
MSSA	8	7
Other Pathogens	2	0
No Pathogens	45	45
TOTAL	60	50

**BACTERIA ISOLATED AT MILPARK HOSPITAL
DURING MAY AND JUNE 2008**

GRAM POSITIVE		GRAM NEGATIVE	
MSSA	66	Acinetobacter	87 (Pan 47)
MRSA	25 (27%)	Citrobacter	7
MSSE	27	Coliform	0
MRSE	47 (63%)	E.coli	64 (ESBL 8)
Streptococci	18	Enterobacter	23
Enterococci	49	Klebsiella	92 (ESBL 60)
Other gram positives	9	Morganelli	9 (ESBL 2)
TOTAL	173	Proteus mirabilis	19
		Providencia	0
		Pseudomonas	106 (Pan 22)
		Serratia	8
		Stenotrophomonas	8
		TOTAL	423

**BACTERIA ISOLATED AT MILPARK HOSPITAL
DURING JULY AND AUGUST 1999**

GRAM POSITIVE		GRAM NEGATIVE	
MSSA	88	Acinetobacter	87
MRSA	109 (55%)	Citrobacter	8
MSSE	36	Coliform	23
MRSE	122 (77%)	E.Coli	79
Streptococci	34	Enterobacter	53
Enterococci	67	Klebsiella	46
Other gram positives	10	Morganelli	
TOTAL	466	Proteus mirabilis	37
		Providencia	5
		Pseudomonas	116
		Serratia	11
		Stenotrophomonas	
ESBL were not a problem		TOTAL	465