

# THE BACTERIAL CONTAMINATION IN PREMISES OF GJILAN REGIONAL HOSPITAL FOR THE YEAR 2011

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## **Abstract**

*Introduction: Characteristics of hospital environment and its accompanying micro flora increase the risk for presenting between hospitals infections (nozocomial).*

*Purpose: The main aim of this study was to determine the etiology of bacteriological contamination in hospital environments in order to research the potential risk for introduction of hospital infections.*

*Material and methodology: It's based on retrospective analysis of Microbiology laboratory results. In order to control bacteriological contamination of the hospital environment, are taken from the smear areas and working surfaces, equipment, instruments, and personnel (hands, uniform). Identification of microorganisms is made with standard microbiological test. Sampling was done according to the Law No. 02/L-78 Public Health and the Law on Preventing and Combating Infectious Diseases No 02/L-109. Sampling was done without notice to the appropriate service request.*

*Results: During the year 2011 in order to control sanitation standards and determination of bacteriological pollutants in Gjilan Regional Hospital made 61 sampling units and different countries and in this case a total of 576 swab were taken from work surfaces, floors, tools, labor, tools, utensils, personnel (hands, uniform) as well as sterility. Of the total number of swabs, 60 (10.41%) resulted positive with pathogens. The highest contamination was recorded in the Department of Neonatology 41.66%, followed by Pediatrics 20.00%. Swabs from the staff, resulted in 19.48% contamination, medical equipment and inventory with 11.11%, 9:55% patient environment. 29 were taken sterility and contamination resulting smear 4 or 13.79%. Also from operating rooms to intensive care from 1378 or 5.83% smear positive result. From isolated bacteria most widespread is Enterobacter 26.66%, Acinetobacter 15% and so on.*

*Conclusions: The data indicate that contamination is widespread and need added attention because there is a risk of introduction of infections between hospitals.*

*Keywords: hospital, bacterial, contamination, smears.*

**Introduction:**

Hospital environments and its micro flora increase the risk of intra-hospital infections (nosocomial infections). (1)

As the risk factors for intra-hospital infection are: length of stay in hospital, surgical interventions (catheterization, respirators and other instruments that damages the epithelial barriers), immune-compromised patients (Chemical-therapy), antibiotic therapy (> 10 days), presence of multi-resistant microorganisms in the hospital premises and the possibility of their genetic mutations. (2)

Control of bacterial contamination in medical institutions is one of quality standards and has a crucial role for the welfare and safety of patients, health workers and visitors. This control includes the majority of wards within the hospital and summarizes issues pertaining to quality, risk management and protection from infections in the workplace. (3,4,5).

**Purpose:**

The main aim of this study was to determine the etiology of bacteriological contamination in hospital environments in order to research the potential risk for introduction of hospital infections.

**Material and methodology:**

It's based on retrospective analysis of Microbiology laboratory results. In order to control bacteriological contamination of the hospital environment, are taken from the smear areas and working surfaces, equipment, instruments, and personnel (hands, uniform). Identification of microorganisms is made with standard microbiological test. Sampling was done according to the Law No. 02/L-78 Public Health and the Law on Preventing and Combating Infectious Diseases No 02/L-109. Sampling was done without notice to the appropriate service request.

**Results:**

During the year 2011 in order to control sanitation standards and determination of bacteriological pollutants in Gjilan Regional Hospital, from 61 units and different places has

been taken 576 samples-smears from work surfaces, floors, surgical tools, labor tools, utensils, personnel (hands, uniforms) and sterilized instruments.

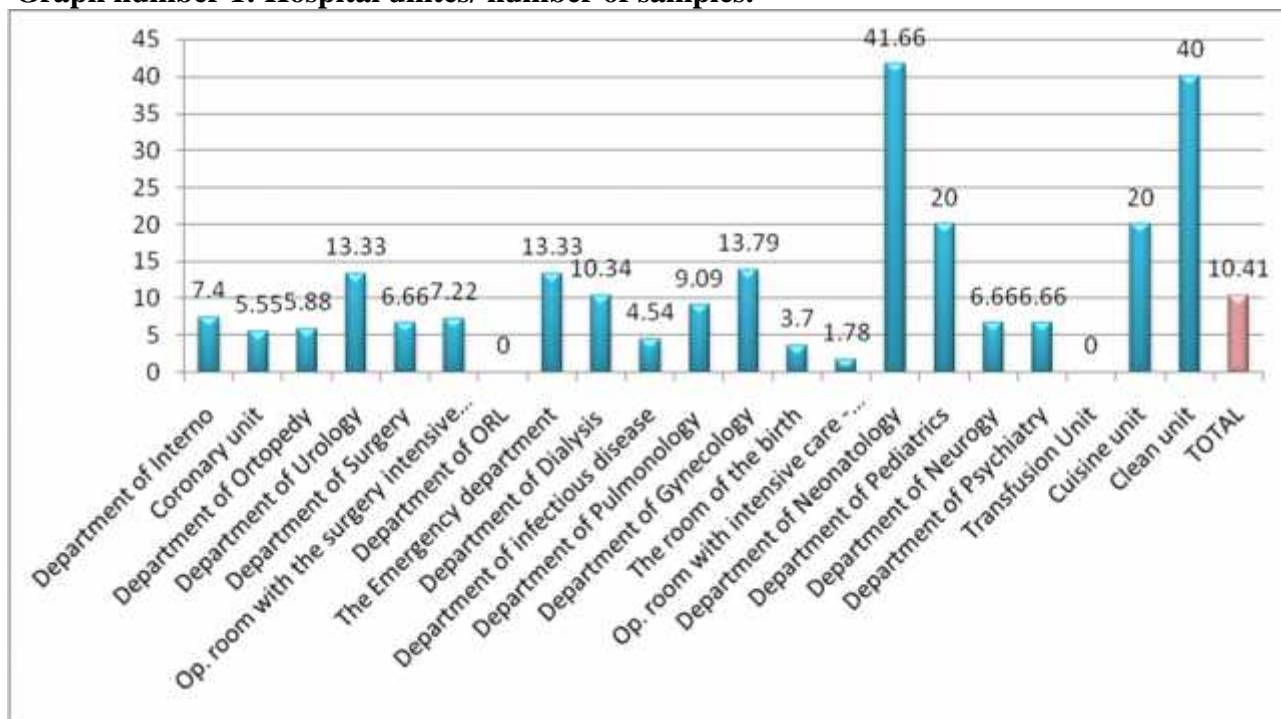
**Table number 1: Results of bacterial contamination in Gjilan Regional Hospital for period of time January- December 2011.**

Nr	Place of sampling	The number of sampling	The number of samples	Negatives	Positive		Bacteria isolated
					Nr.	%	
1	Department of Internal Coronary unit	3	28	25	3	7.40	Staphylococcus aureus 1, Enterococcus spp.1, Citrobacter freundii 1,
	Department of Orthopedic	3	18	17	1	5.55	Streptococcus spp.1
2	Department of Urology	3	17	16	1	5.88	Staphylococcus aureus 1,
3	Department of Surgery	3	15	13	2	13.33	Streptococcus spp.1, Acinetobacter1,
4	Op. room with the surgery intensive care	3	30	28	2	6.66	Enerobacter 1, Enterococcus spp.1,
	Department of ORL	3	83	77	6	7.22	Enterococcus spp.1, Streptococcus spp.3 Enerobacter 2,
5	The Emergency department	3	15	15	0	0.0	
6	Department of Dialysis	3	45	39	6	13.33	Citrobacter freundii 1, Staphylococcus aureus 2, Enterococcus faecalis 2, Enerobacter1,
7	Department of infectious disease	3	29	26	3	10.34	Pseudomonas spp. 2, Enerobacter1,
8	Department of Pulmology	3	22	21	1	4.54	E.coli1,
9	Department of Gynecology	3	22	20	2	9.09	Enterococcus.faecalis1, Streptococcus spp.1,
10	The room of the birth	3	29	25	4	13.79	Enerobacter 1, Acinetobacter1, Streptococcus.spp.1, Enterococcus faecalis1.
	Op. room with intensive care - gynecology	3	27	26	1	3.70	Acinetobacter 1,
	Department of Neonatology	3	56	55	1	1.78	Citrobacter freundii 1
11	Department of Pediatrics	3	24	14	10	41.66	Enterococcus faecalis3 Enerobacter 4, Acinetobacter1, Klebsiella enterobacter2,
12	Department of Neurology	3	30	24	6	20	Enterococcus faecalis1, Enerobacter1, Staphylococcus aureus 1, Acinetobacter3,
13	Department of Psychiatry	3	15	14	1	6.66	Streptococcus spp.1
14	Transfusion Unit	3	21	21	0	0	Citrobacter freundii 1,
15	Cuisine unit	3	25	20	5	20	

16	Clean unit	1	10	6	4	40	Enterobacter 4,
<b>Total</b>		61	576	511	60	10.41	

Of the total number of smears, 60 (10.41%) resulted contaminated with pathogens. The highest contamination was recorded in the Department of Neonatology 41.66%, followed by Pediatrics 20.00%.

**Graph number 1: Hospital unites/ number of samples.**



**Table number 2: Results of smears taken from medical personnel**

January-December 2011	Place of sampling	The number of samples	Negatives	Positive		Bacteria isolated
				Nr	%	
	Uniforms	37	30	7	18.91	Streptococcus spp.1, Enterobacter 2, Enterococcus spp.1, Staphylococcus aureus 2, Acinetobacter 1,
	Hands	40	32	8	20.0	Enterobacter 6, Klebsiella, Enterobacter 1, Pseudomonas spp.1
	The total number	77	62	15	19.48	

From total smear-samples taken from personnel (uniform, hands), with bacterial contaminations resulted 19.48%. From total number of smears-samples taken from hands, 20% of samples resulted with bacterial contaminated.

**Table number 3: Medical equipment and inventory**

	Place of sampling	The number of samples	Negatives	Positive		Bacteria isolated
				Nr.	%	
January-December 2011	The Cupboard therapy, therapy cart, hanging ring, work tables, cassettes	68	64	4	5.88	Enterococcus faecalis 2, Staphylococcus aureus 1, Enterobacter1,
	Tripod infusion, monitor button, inhaler mask, oxygen mask, duct aspiratory,	69	58	11	15.94	Enterococcus faecalis 3, Streptococcus spp.1, Enterobacter 3, Staphylococcus aureus2, Klebsiella enterobacter 1, Citrobacter freundii 1,
	Locker bread, bread cart, gloves refrigerator, faucets, tables, dishes	61	54	7	11.47	Acinetobacter 2, Citrobacter freundii 2, Pseudomonas spp.1, Acinetobacter 2,
	The total number	198	176	22	11.11	

Samples from medical equipment and inventory: 11.11% resulted with bacterial contamination.

**Table number 4: Samples taken from patient environment**

	Place of sampling	Number of samples	Negatives	<i>Positive</i>		Bacteria isolated
				<i>Nr.</i>	<i>%</i>	
January-December 2011	Bed, coverings	64	59	5	7.81	Enterococcus faecalis 1, Staphylococcus aureus2, Enterobacter1, Acinetobacter 1,

Flooring, wall	53	47	6	11.32	Citrobacter freundii 1, Enterococcus spp.1, Acinetobacter1, E.coli1, Enterococcus faecalis 1, Enterobacter 1,
Cupboard, tapes	29	27	2	6.89	Staphylococcus aureus1, Streptococcus spp.1,
The total number	136	123	13	9.55	

Samples taken from the patients' environment (Beds, coverings, flooring, walls, cupboards, tapes): 9.55% resulted with contamination.

**Table number 5:** Results of analyzed samples taken from equipments and sterile materials

	Place of sampling	Number Samples	Negatives	Positive		Bacteria isolated
				Nr.	%	
January-December 2011	Surgery	5	5	0		
	Gynecology	4	3	1	25.00	Streptococcus spp.1,
	Neonatology	0		0	0.0	
	ORL	4	3	1	25.00	Staphylococcus saprophyticus 1,
	Orthopedics	4	4	0	0.0	
	Urology	3	1	2	66.66	Streptococcus spp. 1, Acinetobacter1, B.S.1,
	Emergency	9	9	0	0.0	
	The total number	29	25	4	13.79	

From 29 samples taken from tools and material, with bacterial contaminations resulted 4 or 13.79 %;

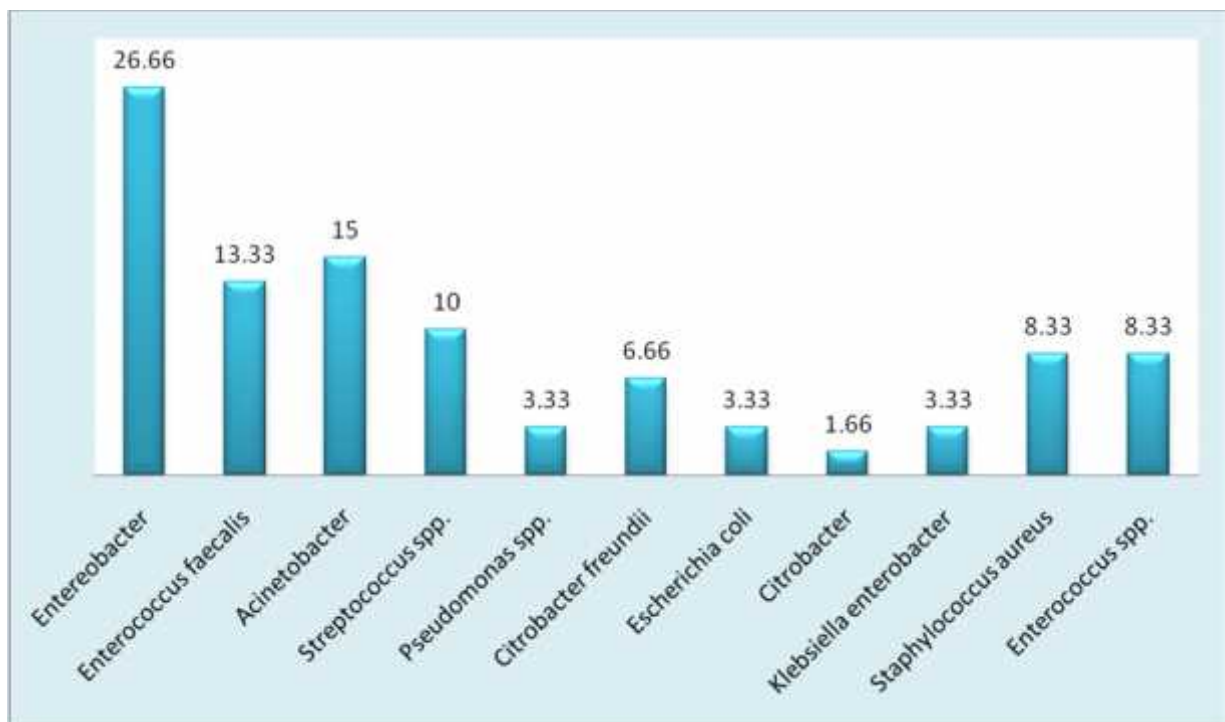
**Table number 6:** Operative theatre

ry- Dece mber	Place of sampling	No of samples	Negative	Positive		Bacteria isolated
				Nr.	%	

Operating room with the surgery intensive care	81	75	6	7.40	Streptococcus spp. 3, Enterobacter2,Enterococcus spp1,
Operating room with intensive care - gynecology	56	54	2	3.57	Citrobacter freundii 1, Staphylococcus aureus 1,
The total number	137	129	8	5.83	

From 137 samples taken in Operating theatres and intensive care rooms, 8 or 5.83% resulted contaminated.

### Graph number 2: Reports of pathogen bacteria's isolated from analyzed samples.



From isolated bacteria most widespread was Enterobacter 26.66%, Acinetobacter 15% and so on.

### Conclusions

The data indicate that contamination is widespread in hospital staff, medical equipments, different tools and sterile materials. The potential risk for intra-hospital infections is really

high. Therefore the immediate measures that has to be undertaken are: betterment of hygienic activities, overall disinfection and proper sterilization of materials. Also is needed the continuing education of medical personnel and technical staff in order to ensure clean environment and safe for patients and staff.

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