The Incidence of Nosocomial Infection at the Rehabilitation Medicine Ward of a Tertiary Government Hospital

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ABSTRACT

Objective. This prospective cohort study was undertaken to determine incidence of hospital acquired infection among patients admitted to the Rehabilitation Medicine Ward at the Philippine General Hospital.

Methods. The 70 participants were all patients admitted to the Rehabilitation Medicine Ward during the study period of three months, from September to November 2008. Baseline complete blood count, urinalysis and chest x-ray were determined on admission, to rule out community acquired infections. The patients were observed during admission at the ward if they develop any infection through signs and symptoms and subsequent laboratory work up for infection. If fever, difficulty of breathing or dysuria were noted during the first 48 hours, the case was excluded and was considered community acquired upon confirmation of infection. If signs and symptoms of infection were noted beyond 48 hours, the infection was considered nosocomial. Validation was through appropriate laboratory workup.

Results. The average length of hospital stay was 28.37 days. Only three of the 70 subjects developed nosocomial infections; two had cerebrovascular disease (CVD) and one had spinal cord injury (SCI). All three had urinary tract infections. The two CVD patients had indwelling catheters while the patient with SCI was undergoing self clean intermittent catheterization. The three developed infection at various days of stay: 5th, 9th and 17th days. The length of stay of the three patients with nosocomial infection was an average of 30 days, similar to the average stay of 28 days for all admissions. The study showed that the Rehabilitation Medicine Ward had a nosocomial infection incidence rate of 4.29% of total admissions and 15.79% of total catheterized patients for nosocomial infection attributed to catheterization.

Conclusion. The study revealed a low incidence of nosocomial infection, all urinary. The study alerts the rehabilitation health workers handling inpatients on catheterization, especially older patients, to be vigilant and to anticipate urinary tract infections.

Key Words: nosocomial infection, Rehabilitation Medicine, catheterization, urinary tract infection

Introduction

The Rehabilitation Medicine Ward at the Philippine General Hospital is a sixteen-bed ward inpatient facility composed of two large rooms and one small room. There is no air conditioning but ceiling fans and large windows are present in the rooms. The corridor walking traffic is similar to traffic in other corridors in the hospital. There are no waiting areas.

The diagnoses of patients in the Rehabilitation Medicine Ward in recent years range from stroke to amputation. Age ranges from the very young to the elderly. The patients usually have long hospital stays. Certain types of diseases, the elderly and longer stay in the hospital equate to the increased risk of developing hospital acquired infections.[1]

The patients admitted at the Rehabilitation Medicine Ward are relatively medically stable; it is presumed that the ward has a clean environment. There is limited data on the incidence of infections in the Rehabilitation Medicine Ward setting.[1]

Santus et al. studied bacteriuria in the Rehabilitation Medicine department and reported a significant number of patients infected by nosocomial bacteria.[1] The authors noted 28.9% to 41.9 % incidence of significant bacteriuria, with a high incidence of urinary tract infections.

There is an increasing number of admissions due to spinal cord injury with neurogenic bladder and bowel problems. The common practice of intermittent catheterization in these patients increases their risk for infections.

With the increasing use of instrumentation like catheterization, it is important to determine the current incidence of infection to be able to institute prompt corrective measures and treatment. This study may also reflect the current antiseptic techniques of the medical and nursing staff, and the caregivers.

In light of recent advancements in medicine and the boom in the elderly population, a better survival rate is associated with an increase in morbidity. This parallels the increase in admissions of elderly patients in the Rehabilitation Medicine Ward, for treatment of their impairments and disabilities. Paillaud et al. concluded that elderly patients admitted to the Rehabilitation Units are at high risk of developing nosocomial infections.[2] Tan-Torres reported the importance of surveillance of nosocomial infection with its goal of collecting accurate, reliable and timely data on infections and notifiable diseases acquired within the hospital and that the data collected should also be analyzed in terms of temporal and geographic trends.[4]

This study was undertaken to determine the incidence of nosocomial infections affecting patients admitted to the Rehabilitation Medicine Ward of the Philippine General Hospital. It also aims to identify which patients are prone to infection in the Rehabilitation Medicine setting, as well as the possible causes that may have contributed to the

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infection.

The study also aims to make appropriate recommendations to address and reduce the risk of nosocomial infections.[4]

Methods

The participants of the study included all consecutive patients admitted to the Rehabilitation Medicine Ward from September to November 2008. Upon admission, the patient was informed of the study and, upon signed consent, the patient was included in the study. Initial vital signs of the patients were recorded. Baseline complete blood count, routine urinalysis and chest radiograph were performed on all patients. For spinal cord compression or spinal cord injury and stroke patients with concomitant neurologic bladder, urine gram stain and culture studies were also done. The vital signs including temperature of the patients were monitored throughout the patients' hospital stay.

If the patient's baseline complete blood count, routine urinalysis or chest radiograph were consistent with an infection, the patient was excluded from the study; the infection was considered community acquired. If the patient developed signs and symptoms of infection during the first 48 hours of admission such as fever, difficulty of breathing or dysuria, appropriate diagnostic examinations were performed. If the laboratory result was consistent with infection, the case was considered community acquired and excluded from the study.

Beyond 48 hours of admission, the vital signs and symptoms of all patients were monitored continuously. If a patient develops signs and symptoms of infection, the appropriate diagnostic examinations were performed to confirm the presence of infection. Upon confirmation of the infection after 48 hours of admission, the infection was considered nosocomial in origin.[6] The definition of nosocomial infection was based on the Center for Disease Control (CDC) guideline of 1988.[6] All patients admitted who developed infections were treated accordingly, with the proper medications appropriate for the infection. The data was analyzed by computing the incidence rate and through descriptive analysis.

Results

A total of 70 patients were admitted during the three month study period from September to November 2008. The age range of the patients was one to 75 years, with a mean age of 42.01 years. There were 44 males and 26 females. Most of them belonged to the working age group of 19 to 45 years old. (Table 1)

Table 1. Patient distribution by age

Age ranges (years)	Number of patients
0 - 11	8
12 - 18	5
19 – 45	27
46 – 65	18
66 – up	12

Patients with various diagnoses were admitted to the Rehabilitation Medicine Ward in the three month study period. Amputation comprised the most number of admissions followed by patients with spinal cord injury. (Table 2)

Table 2. Diagnosis of patients admitted to the Rehabilitation Ward

Diagnosis	Number of Patients	Percentage (%)
Amputation	24	34.29
Spinal Cord Injury	14	20.00
Fractures	10	14.28
Cerebro-Vascular Disease	9	12.86
Multiple Congenital Anomalies	5	7.14
Burn	3	4.29
Cerebral Palsy	2	2.86
Parkinson's Disease	2	2.86
Meningitis	1	1.43
Total	70	100

Table 3. Diagnosis of patients admitted during the study period at the Rehabilitation Ward per month

Diagnosis	1st	2nd	3rd	Total
Amputation	6	9	9	24
Fractures	5	3	2	10
Spinal Cord Injury	5	6	3	14
Cerebro-Vascular Disease	4	4	1	9
Multiple Congenital Anomalies	1	1	3	5
Burn	2	1	0	3
Cerebral Palsy	0	1	1	2
Parkinson's Disease	1	1	0	2
Meningitis	0	0	1	1
Total	24	26	20	70

The top three cases seen per month remained relatively similar (amputation, fractures and spinal cord injury); the total number of admitted patients per month remained relatively constant. (Table 3) The average length of stay of the patients during the three-month study period was at 28.37 days. (Table 4)

Table 4. The average length of patients' hospital stay at the Rehabilitation ward during the study period

Month	Average Length of Stay (days)
1st	18.23
2nd	26.38
3rd	40.50
Overall average length of stay	28.37

Only 3 of the 70 patients (4.26%) developed nosocomial infection, all of which were urinary tract infections. There was a 7.14% incidence of nosocomial infection among patients with spinal cord injury and 22.22% infection rate among patients with cerebrovascular disease. The overall nosocomial infection rate at the Rehabilitation Medicine Ward was 4.26%. (Table 5)

Three of the 19 patients (15.79%) on catheterization

Table 5. Patients admitted with nosocomial infections

Diagnosis	No of patient infected	No of patients	Percentage
Amputee	0	24	0
Fractures	0	10	0
Spinal Cord Injury	1	14	7.14 %
Cerebro-Vascular Disease	2	9	22.22 %
Multiple Congenital Anomalies	0	5	0
Burn	0	3	0
Cerebral Palsy	0	2	0
Parkinson's Disease	0	2	0
Meningitis	0	1	0
Total	3	70	4.26 %

Table 6. Catheterized patients with nosocomial infections

Diagnosis	No of catheterized patients infected	No of catheterized patients	Percentage of infected
Amputee	0	0	0
Fractures	0	0	0
Spinal Cord Injury	1	13	7.7 %
Cerebro-Vascular Disease	2	2	100.0 %
Multiple Congenital Anomalies	0	0	0
Burn	0	3	0
Cerebral Palsy	0	0	0
Parkinson's Disease	0	0	0
Meningitis	0	1	0
Total	3	19	15.79 %

developed nosocomial infection. (Table 6)

The following were the patients infected: Patient 1 is a 75 year old female diagnosed with cerebrovascular disease (CVD) on indwelling catheter which was changed every five days; she developed fever on her 17th hospital day. Urinalysis showed 10 to 20 red blood cells (RBC) and a white blood cell (WBC) count of 40 to 50; urine culture revealed *E. coli* and *Enterococcus falcium*. Patient 2 is a 62 year old male CVD patient on indwelling catheter changed every five days who developed fever on the 5th hospital day. Urinalysis revealed abundant white blood cell count, and urine culture of >100,000 colonies of *E. coli*. Patient 3 is a 37 year old, male, diagnosed with spinal cord injury (SCI) on clean intermittent catheterization, developed fever on the 9th hospital day. Urinalysis revealed abundant white blood cell count, urine culture of greater than 100,000 colonies of Pseudo-aeroginosa.

The three patients were nondiabetic. The two CVD patients were catheterized on admission. The three patients developed infection at various days of stay: fifth, ninth and 17th days. The length of stay of the three patients with nosocomial infection was an average of 30 days, similar to the average stay of 28 days for all admissions. These patients confirmed to have infections were treated with the appropriate antibacterial management.

Discussion

Among the 70 patients admitted to the Rehabilitation Medicine Ward of the Philippine General Hospital, only three patients developed nosocomial infection with an incidence rate of 4.29% of total admissions and 15.79% nosocomial infection of total patients on catheterization. The patients who developed infections were cases of CVD and SCI patients. All of them were non-diabetic, on catheterization and developed urinary tract infections.

The rate of nosocomial infection in this study is relatively low at 4.29% in a 16-bed ward compared with the infection rate of urinary tract bacteriuria of 41.9% in an Italian rehabilitation facility[1] and the hospital wide rate of 16% as reported by the Hospital Infection Control Unit (HICU) in 1990. The low rate of nosocomial infection may reflect the relatively good aseptic techniques of the staff and the environment of the Rehabilitation Medicine Ward. A possible limitation of this study is that the other patients admitted were relatively younger and able-bodied individuals who suffered from amputation of the limbs and their stay was shorter than those of patients with other conditions.

Conclusion

The incidence rate of 4.29% of total admission and 15.79% of patients on catheterization reveal a low incidence for nosocomial infection, all of which were attributed to urinary catheterization. In spite of the practice of clean and aseptic techniques, the Rehabilitation Medicine health providers handling patients, especially elderly patients and on catheterization must be alerted to be continuously vigilant and anticipatory, since these patients are prone to develop urinary tract infections in the Rehabilitation Medicine Ward. Infection, even if low, should never be acceptable.

Recommendations

The authors recommend a longer study period and multicenter studies on nosocomial infection in rehabilitation facilities for further comparison of incidence rates and etiology of infections.

It is also recommended that the incidence rate of infection in patients on catheterization from various departments or wards in the Philippine General Hospital be undertaken to compare the risk of infection with this kind of instrumentation.

The findings of this study are pertinent to the practice of better patient care and a possible source for hospital policies and clinical practice guidelines in the care of these patients.

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