

## Prevalence of Medical Problems Requiring Surgical Intervention (MPRSI) in Diabetic Patients

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### Abstract:

**Introduction:** Diabetes Mellitus (DM) has become a major health problem to the whole world as it plays a major role in causing surgical problems like peripheral vascular disease (PVD), cataract, ischemic heart disease (IHD) foot ulcer, chronic renal failure and skin and subcutaneous sepsis.

**Objective:** The main objective is to identify the prevalence of medical problems which require surgical intervention (MPRSI) in DM patients. It also aims to assess the patient's knowledge regarding those conditions and to identify possible reasons for the development of MPRSI in DM.

**Methods:** This is a cross-sectional and prospective study. A study was conducted using diabetic patients who attended to the diabetic clinic at Teaching Hospital Karapitiya (THK). Data was collected by using a pretested self-administered questionnaire.

**Results:** A total of 200 patients were included in this study. Sixty six point five percent of the study population had MPRSI in DM. The problems were more common in females than males (67% and 33%). The prevalence of those conditions was as follows; peripheral neuropathy 55.5%, cataract 10%, wound infections 7.5%, peripheral vascular disease (PVD) 7.5%, ischaemic heart disease (IHD) 5%, abscess 3.5% and renal failure 2.5%. The main possible causal factor for development of MPRSI was the poor control of DM resulting from poor compliance with their diet control (71%) and or taking anti diabetic drugs at correct time (66%). This was reflected by persistently high blood glucose level among them.

**Conclusion:** The results showed that peripheral neuropathy is the commonest MPRSI among DM patients in the study sample. Cataract, wound infections, peripheral vascular disease (PVD), ischaemic heart disease (IHD), abscess and renal failure were the next in order. Females had higher prevalence of MPRSI than males. The most possible reasons for the development of MPRSI was poor control of DM which intern related to poor compliance for drug treatment and dietary control.

**Keywords:** Diabetes mellitus, medical or surgical problems in diabetes mellitus

### I. Materials and Methods

This was a prospective cross-sectional study. The stratified random sampling method was used to select the sample. The data was collected from two hundred patients with DM who attended the diabetic clinic in THK from 20<sup>th</sup> April 2013 to 20<sup>th</sup> May 2013. Their medical problems were assessed by using patients' records and examination of the patients. The data was collected by using a questionnaire which consists of four parts. The first part included demographic data of the patient (age, sex, height and weight, ethnicity, religion, marital status, family history of the DM, type of DM, educational level, occupation and monthly income of the family). The second part included the patient's knowledge about the DM. This was evaluated through 5 questions which assess the patients' knowledge on diagnosis of diabetes, symptoms and treatments of DM, MPRSI in DM and possible causes for DM. The questionnaire was introduced and filled by the researcher.

### Objectives

1. To evaluate the prevalence of MPRSI in diabetic patients who are attended to the diabetic clinic at THK.
2. To identify the type of the DM that causes MPRSI commonly.
3. To evaluate the patient's knowledge of MPRSI in diabetic patients.
4. To identify the possible reasons for the development of MPRSI in DM.

### II. Results

The study sample composed of 200 patients who included 135(67.5%) females and 65 (32.5%) males. Out of them prevalence of the MPRSI was 66.5%(133/200) (22% in males and 44.5% in females). The age group was categorized into: 18-27 years, 28-37 years, 38-47years, 48-57 years, 58-67 years and more than 67 years. Most of the patients in the study group belonged to the age group 48-57 years while the mean age was 42.5 years.

Family history of the patient was categorized into: 1<sup>st</sup> degree, 2<sup>nd</sup> degree and negative for family history as shown in Table 1.

**Table 1 - Family history distribution of patients with and without MPRSI in DM**

Family History	Patients with MPRSI		Patients without MPRSI	
	N	percent (%)	N	percent (%)
1 <sup>st</sup> degree	70	35%	38	19%
2 <sup>nd</sup> degree	3	1.5%	1	0.5%
Negative	60	30%	28	14%
Total	133	66.5%	77	33.5%

Majority of the patients with MPRSI in DM showed positive family history for DM (36.5%).

**Types of the MPRSI in DM patients**

Type of the problems was categorized into: cataract, chronic wounds, peripheral neuropathy, renal failure, peripheral vascular disease, ischaemic heart disease, and abscess. The most common condition was the peripheral neuropathy. Table 2 shows the types and the number of patients.

**Table 2 - The types of the MPRSI in DM patients**

Type of the problem	No of patients
Cataract	20
Chronic Wound	14
Peripheral neuropathy	111
Renal failure	5
Peripheral vascular disease	14
Ischemic heart disease/myocardial infarction	10
Abscess	7

There were patients who had more than one MPRSI condition at the time of the study (35/200). The table -3 illustrates it.

**Table 3 - No. of MPRSI condition and the number of patients**

No. of conditions	No. of patients
1	97
2	26
3	6
4	3

According to the data in the table – 3 the most of the patients (97/200) had only one MPRSI condition. Patient’s knowledge about the DM was accessed under five 5 main topics. Those include diagnosis of the DM, symptoms of DM; treatments of DM, MPRSI in DM and causes for DM. their knowledge were assessed giving a score for a correct answer. Depending on the obtained score knowledge was categorized as poor, average or good. The maximum score that one could obtain was 16.

The mean knowledge score of men and women is shown in the table -4. According to that there was no significant difference in knowledge between men and women (p=0.599).

**Table 4 – Knowledge score and gender**

Knowledge	Sex	N	Mean
	Male	65	14.51
	Female	135	14.56
Total		200	

Similarly the knowledge was compared with the educational level of the patients and between patients who were with and without MPRSI and the results is shown in the table -5 The educational level was categorized into those who have studied less than or up to ordinary level (O/L) and those who have studies above O/L. there was no significant differences in the knowledge level between these two groups. (p=0.567).

**Table 5 – Knowledge compared with educational status of patients**

Educational level	N	Mean
Studies up to ( O/L)	127	14.43
Studies More than O/L	73	14.74
Total	200	

**Table 6 - Knowledge between patients with surgical problem and patients without surgical problems**

Knowledge	Surgical problems	N	Mean
	Patients with surgical problems	133	14.59
	Patients without surgical problems	67	14.48

There were no significant difference in knowledge among these two groups as well (p=0.709). To assess the possible causes for MPRSI in DM, questions were asked to check the compliance for attending diabetic clinic regularly, taking drugs at correct time and as prescribed, controlling diet and regular checking of blood sugar levels. Out of the 133 patients who had MPRSI 66% was not compliance with drug treatment while 71% was not controlling their diet and 83% were not checking FBS regularly. Seventy five percent of them had persistently high FBS level. However majority of them (64%) have followed clinic regularly. The results are illustrated in the table- 7.

**Table 7- Possible reasons for the MPRSI in DM and their Fasting Blood Sugar level**

Possible reason	N	Percent (%)
Continuous attend to the clinics		
Yes	85	64%
No	48	36%
Drugs get at correct time		
Yes	45	34%
No	88	66%
Diet control		
Yes	39	29%
No	94	71%
Regular checking of FBS level		
Yes	23	17%
No	110	83%
FBS level		
Normal (80-110 mg/dl)	33	25%
High (more than 110 mg/dl)	100	75%

### III. Discussion

Diabetes mellitus (DM) is a chronic disease which occurs when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin. There are two types of DM which are known as type1 and type 2. Type 1 DM results from the body's failure to produce insulin. Type 2 DM results from insulin resistance, a condition in which cells fail to response to insulin properly. Sometimes this is combined with an absolute insulin deficiency. Polyuria, polydipsia and weight loss are the classical symptoms of DM (Weerarathna T, 2010). DM affects 230 million people worldwide. (Draper R, 2011) There is a rising incidence and prevalence of diabetes mellitus (Draper R, 2011). About 50% of people with diabetes mellitus are unaware of their condition. (Draper R, 2011) DM badly affects almost all the body systems, as follows:

#### 1. Cardiovascular system

Coronary artery disease (CAD): diabetic patients are at high risk of developing large vessel CAD (Draper R, 2011). Diabetes is the most common cause of myocardial infarction in people under the age of 30 years (Draper R, 2011). Peripheral vascular disease (PVD): PVD is narrowing of one or more arteries of the limbs. It mainly affects lower limb arteries. The main early symptom is intermitted claudication. The narrowing of the arteries is caused by atheroma (Kenny T, 2012).

#### 2. Nervous System

Problem of nervous system includes peripheral neuropathy leading to skin ulcerations and autonomic neuropathy causing systemic problems like diarrhea, urine incontinence etc.

#### 3. Skin

Eczema, cellulitis, corns, gangrene and ulceration

#### 4. Immune system

DM patients are at higher risk for wound infections including surgical wounds sepsis and subcutaneous abscesses (Kim J, 2010). This is mainly related to low immunity.

#### 5. Eye

Both types of DM affect eyes in many ways. They include diabetic retinopathy, cataract and glaucoma.

Some of these problems require surgical intervention. Those include PVD, foot ulcer, cataract, IHD, chronic renal failure which need renal transplantation, skin and subcutaneous sepsis including abscesses and peripheral neuropathy leading to trophic ulcers. These are considered as MPRSI in DM in this study.

The study consists of 200 patients with DM. Out of these, 67.5% (n=135) were females and 32.5% (n=65) were males. A study on DM prevalence in Sri Lanka which was done in 2005 showed that 14.2% of males and 13.5% of females were suffering from DM (Katulanda P et al , 2006). But the study done by Khalid showed that the prevalence of diabetes was 34.1% in males and 27.6% in females (P<.0001) in Saudi population (Khalid A. Alqurashi, 2011).

The mean age of our study group was 42.5 years. A similar study done on Saudi population showed the mean (SD) age of their patients as 55.3 years (Khalid A. Alqurashi, 2011). This shows that there are more young diabetic patients in our study population. Out of the 200 patients 133 (66.5%) had MPRSI in DM. Most of them were females (females 67% and male 33%). This shows MPRSI occurs more frequently in females than that of males. Meanwhile type2 DM seems to get MPRSI in DM more frequently (66%) than that of type 1 DM (34%) When considering the patient's knowledge about DM its treatments and complications, there was no significant difference among variables we assessed (gender, educational status etc.) This may be due to the good health education service of clinic staff and availability of other sources for acquiring knowledge on disease conditions.

DM causes eye problems and may lead to blindness. People with diabetes do have a higher risk of blindness than people without DM. But most of people who have DM have nothing more than minor eye disorders. (American Diabetes Association, 2013). This includes retinopathy, cataract and glaucoma. Diabetic retinopathy occurs in 20% of patients with DM (Draper R, 2011). This is the most well-known ocular complication of DM and the leading cause of blindness among people 20–64 years of age in the U.S.A. (Jeganathanal, V.S.E.et al., 2008). However we encountered only cataract as the MPRSI in DM related to the eye in our study group. The prevalence of cataract was 10% in our sample. A study did in Russia show overall prevalence of 30.6% diabetic cataract (DC) among adult diabetic patients. (Ivan Dedov, 2009).

Diabetic neuropathies are a family of nerve disorders occur in DM. People with DM can, develop nerve damage throughout the body. Some people with nerve damage have no symptoms. Others may have symptoms such as pain, tingling, numbness or loss of feeling in the hands, arms, feet, and legs leading to trophic ulcers. Nerve problems can occur in every organ or system, including the digestive tract, heart, sex organs and limbs (peripheral neuropathy) (The National Diabetes Information Clearinghouse, 2012). In our study we considered only the peripheral neuropathy which leads to pressure point ulcerations and requiring surgical intervention. The prevalence of peripheral neuropathy was 55.5 in the study population. A similar study done in Sudan showed a prevalence of 31.5% in hospital inpatient clinics and 36.7% in outpatient clinics. The overall prevalence of DM peripheral neuropathy was around 54.45 at King Hussein Hospital in Jordan (Al-Sarihin, 2013).

Peripheral vascular disease (PVD) leads to narrowing of the arteries due to atherosclerosis. It mainly occurs in lower limb arteries. The main early symptom is intermitted claudication (Kenny, 2012). It is present in 25-30% of diabetics and is an important indicator for systemic atherosclerosis (Draper R, 2011). In our study prevalence of PVD was 7%, but similar study done in the Al-Ain district of the United Arab Emirates showed 11.6% of their subjects with PVD (Al-Maskari F.et al, 2007). Myocardial infarction (60%) and strokes (25%) account for main causes of deaths in patients with diabetes (Simon h, 2013). The high risk of large vessel coronary artery disease (CAD) in diabetic patients is well recognized. The Framingham study shows a risk of developing CAD is greater in DM. The male to female risk ration is 2.4:5.1 (Draper R, 2011). A large body of epidemiological and pathological data documents that diabetes is an independent risk factor for CAD in both men and women (Wilson, (Zieve, 2013) (Plus, 2013) (Simon, 2013) (Stachowiak, 2008) 1998- McGill, 1998) In our study CAD prevalence was little low (5%) but a similar study done in the Al-Ain district of the United Arab Emirates had 14.4% of coronary artery disease (Al-Maskari F.et al., 2007)

#### **IV. Conclusion**

The results showed that peripheral neuropathy is the commonest MPRSI in DM among the study subjects. Cataract, PVD and wound infections were next in line. MPRSI in DM is more prevalent in type2 DM than that of type1DM. Females had highest prevalence of MPSRI in DM than males. When considering the knowledge, the study subjects had sound knowledge on different aspects of diabetes we assessed and there was no significant difference in knowledge among different variables we assessed. This highlights the status of health education of these participants. However the poor compliance in controlling diet and taking antidiabetic drugs therefore persistent high blood glucose level leads to development of MPSRI in DM.

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