

Original Article

Impact of Glycemic Status on Oncological Emergencies In A Tertiary Care Hospital In Bangladesh: A Preliminary Study

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Abstract

Background : Dealing oncologic emergencies are challenging tasks for any concerned physician. The task becomes even more challenging if the scenario is complicated with diabetes and vice-versa. The burden of non-communicable diseases such as cancer and diabetes is also increasing throughout the world resulting in increasing morbidity and mortality. To the best of our knowledge, this is the first study in Bangladesh emphasizing on patients presenting with oncologic emergencies where relation to their glycemic status has also been analyzed.

Methods : This cross sectional, observational study was carried out from January 2011 to June 2016. Adult patients of either sex admitted in Internal Medicine Department of BIRDEM (Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders) General Hospital diagnosed with malignancy irrespective of their diabetic status were purposively and consecutively included in this study. Out of 114 such cases 23 patients had oncologic emergencies. Different variables of these 23 cases of oncologic emergencies were analyzed with co-relation to diabetic status, such as age, gender, demography, co-morbid conditions, clinical features, type of malignancy and treatment outcome.

Results : Eight different kinds of oncologic emergencies were observed among 11 different categories of malignancies. Only 23 oncologic emergency cases were identified among 114 cancer patients. The common emergencies were marrow failure (26.1%), Neutropenic sepsis (21.74%) and hypercalcemia (17.39%). The common malignancies were leukaemia (17.39%), carcinoma lung (13.04%), pancreatic carcinoma (13.04%) and multiple metastasis (13.04%).

Two-third of the patients were male (69.57%) and nearly half of the patients aged above 60 years (43.5%). More than half of the patients came from urban background (52.2%). Two-third of the patients were diabetic (73.91%). It was observed that there were 10 cases (43.48%) with 'more than one' co-morbid conditions and all of them belonged to the diabetic group. Those who had no co-morbidities (26.09%) were all non-diabetic ($p < 0.05$). Six cases (26.09%) had more than one clinical features during the critical phase. Out of them 5 were diabetic (21.74%). Most common presenting feature was neurological (17.39%) followed by anaemia (13.04%), lymphadenopathy (8.7%), anorexia (8.7%) and pain (8.7%).

Among these 23 cases only 3 (13.04%) patients recovered from oncologic emergency to baseline status. The condition of 4 patients (17.39%) remained static without further improvement and 4 patients (17.39%) deteriorated. It is to mention that in the diabetic group recovery rate from oncologic emergencies were less and non-responder /deterioration /death / lost from follow up cases were comparatively more. Unfortunately there were 3 cases of death and 9 patients denied further treatment or were lost from follow up.

Conclusion : In this study we conclude that oncological emergencies and co-morbidities were found more frequently in the diabetic group than the non-diabetic counterpart. Since this is a preliminary study, further studies in different institutes should be encouraged in this field to gather more evidence to support our observation.

Key Words : BIRDEM, Diabetes, Oncologic Emergency

Introduction :

An oncologic emergency may be defined as any acute potentially morbid or life-threatening event directly or indirectly related to a patient's tumor or its treatment.¹ Worldwide management of oncologic emergencies are challenging and the prognosis is also variable. Case detection of both diabetes and cancer seems to be increasing in Bangladesh. No statistical data of diabetic patients with cancer, let alone regarding oncologic emergencies are currently available in our country.

BIRDEM (Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders) General Hospital is mostly serving diabetic

patients with multiple complications. Internal Medicine Department of this hospital treats patients with cancers, especially those who require intensive diabetic care with limited resources and facilities with a view to reduce the sufferings of such cases. Our hospital provides supportive facilities including chemotherapy, intensive care, surgical intervention and oncology day care setup.

Methodology:

This cross sectional, observational study was carried out from January 2011 to June 2016. Adult patients of either sex admitted in Internal Medicine Department of BIRDEM General Hospital diagnosed with malignancy irrespective of

their glycemic status were consecutively included in this study. Out of 114 cancer patients 23 patients had oncologic emergencies. Different variables of these 23 cases of oncologic emergencies were analyzed with co-relation to diabetic status, such as age, gender, demography, co-morbid conditions, clinical features, type of malignancy and treatment outcome. With prior informed consent of the patients data was collected and statistical analysis was done using SPSS software. Level of significance was calculated by chi-square test wherever applicable. P-value < 0.5 was considered significant. Cases were followed up during their hospital stay and after discharge. 'Recovered' was defined as improvement and return to baseline of both clinical and biochemical parameters following supportive management. Cases were defined 'deteriorated' if the patients' condition declined from baseline clinical and biochemical status during management. Patients who failed to return to the baseline status were defined as 'no response'. Patients who expired during hospitalization or after discharge were also noted.

Results:

In this study, we encountered 23 cases of oncological emergencies of different types out of total 114 cancer patients. The common emergencies observed were marrow failure, neutropenic sepsis and hypercalcemia. Other oncologic emergencies (Table-I) included increased intracranial pressure (ICP) with or without seizure, superior vena caval syndrome (SVCO), syndrome of inappropriate anti diuretic hormone secretion (SIADH), tumor lysis syndrome (TLS) and spinal cord compression.

Among these 23 cases of oncologic emergencies, two-third of the patients were male (69.57%) and 7 patients were female (30.43%, Table-I). Table II shows distribution according to age and area of residence. Age in most of the cases was above 60 years (43.5%).

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Table-I: Types of oncologic emergencies with gender distribution

Oncological emergencies	Gender		Total
	Male	Female	
Marrow failure	4	2	6
Neutropenic sepsis	3	2	5
Hypercalcaemia	4	0	4
ICP* ± seizure	0	2	2
SVCO**	2	0	2
TLS #	0	1	2
Spinal cord compression	1	0	1
SIADH##	2	0	2
	16	7	23

*ICP= increased intracranial pressure

**SVCO = superior vena caval syndrome

#TLS = tumor lysis syndrome

##SIADH = syndrome of inappropriate anti diuretic hormone secretion

Table-II: Distribution according to age and area of distribution group (N=23)

Age in Years	Frequency	Percent	Residence	Frequency	Percent
<20	2	8.7	Urban	12	52.2
20-40	2	8.7	Rural	3	13.0
41-60	9	39.1	Sub-urban	8	34.8
>60	10	43.5			

The glycemic status of these patients were noted (Table III). Two-third of the patients were diabetic (17, 73.91%) while the remainder were non-diabetic (6, 26.09%). Data were analyzed relating co-morbidities to diabetic status (Table IV). It was observed that there were 10 cases (43.48%) with 'more than one' co-morbid conditions and all of them belonged to the diabetic group. Those who had no co-morbidities (6, 26.09%) were all non-diabetic. Rest of the patients had hypertension (5, 21.74%) and ischemic heart disease (2, 8.7%), who all belonged to the diabetic group.

Table-III: Distribution of the cases according to glycemic status

Oncological emergencies	Glycemic status		Total
	Diabetic	Non-diabetic	
Marrow failure	4	2	6
Neutropenic sepsis	5	0	5
Hypercalcaemia	4	0	4
ICP ± seizures	1	1	2
SIADH	2	0	2
SVCO	1	1	2
TLS	0	1	1
Spinal cord compression	0	1	1
Total	17	6	23

Table IV: Cross-tabulation of co-morbidities and glycemc status

Co-morbidities	Glycemc status		Total	p-value
	Diabetic	Non-diabetic		
None	0	6	6	
Hypertension	5	0	5	
IHD*	2	0	2	0.002
More than one**	10	0	10	
Total	17	6	23	

*IHD = ischemic heart disease

**means more than any one of the following: hypertension, IHD, dyslipidemia, chronic liver disease

Patients who had oncologic emergencies presented with different clinical features (Table-V). Six of them (26.09%) had more than one clinical features during the critical phase. Out of them 5 were diabetic (21.74%). Most common presenting feature was neurological (4, 17.39%) followed by anaemia (3, 13.04%), lymphadenopathy (2, 8.7%), anorexia (2, 8.7%) and pain (2, 8.7%).

Table-V: Presenting clinical features with glycemc status

Clinical features	Glycemc status		Total
	Diabetic	Non-diabetic	
Neurological*	2	2	4
Anaemia	2	1	3
Anorexia	2	0	2
Lymphadenopathy	1	1	2
Chest pain	1	0	1
Low back pain	1	0	1
Cough	1	0	1
Weight loss	1	0	1
Jaundice	1	0	1
Hepatomegaly	0	1	1
More than one#	5	1	6
Total	17	6	23

*included seizures, acute confusional state, focal neurological signs

#means more than one of the above mentioned features

In this study, oncologic emergencies were found in 11 different malignancies. This data was also correlated with the patient's glycemc status (Table- VI). The common malignancies were leukaemia (4, 17.39%), carcinoma lung (3, 13.04%), pancreatic carcinoma (3, 13.04%) and multiple metastasis (3, 13.04%). Other cases included carcinoma uterus/cervix (2, 8.7%), lymphoma (2, 8.7%), multiple myeloma (2, 8.7%), carcinoma rectum, prostatic carcinoma, Central Nervous System (CNS) carcinoma and primary unknown (1 case each).

Table-VI: Correlation of glycemc status to cancer diagnosis

Diagnosis	Glycemc status		Total
	Diabetic	Non-diabetic	
Leukaemia	2	2	4
Lung ca*	2	1	3
Ca pancreas	3	0	3
Multiple metastasis	2	1	3
Multiple myeloma	1	1	2
Lymphoma	1	1	2
Ca uterus & Cervix	2	0	2
Ca rectum	1	0	1
Prostatic ca	1	0	1
CNS Ca	1	0	1
Primary unknown	1	0	1
Total	17	6	23

*Ca = carcinoma

Among the 23 cases only 3 (13.04%) patients recovered from oncologic emergency to baseline status. The condition of 4 patients (17.39%) remained static without further improvement and 4 patients (17.39%) deteriorated. It is worth mentioning that in the diabetic group recovery rate was poor and non-responder /deterioration /death / lost from follow up cases were comparatively more. Unfortunately there were 3 cases of death and 9 patients denied further treatment or were lost from follow up (Table VII).

Table- VII: Outcome of oncologic emergencies with correlation to diabetic status

Outcome	Glycemc status		Total
	Diabetic	Non-diabetic	
No response	3	1	4
Recovered	1	2	3
Deteriorated	4	0	4
Death in hospital	2	1	3
Lost from FU*	7	2	9
Total	17	6	23

*FU = follow up

Discussion:

Incidence and prevalence of non-communicable diseases such as diabetes, hypertension, cardiovascular disease and malignancy are increasing and getting in the lime light in Bangladesh. There are 1.5 million cancer patients in Bangladesh, with about 200,000 patients newly diagnosed with cancer each year.²

When patients with diabetes are affected with cancer the situation gets complicated. They need special amenities to

deal with complications related to both diabetes and malignancy. In order to share our experience in the field of oncology we conducted a small sample based study of 23 oncological emergencies occurring among 114 cases of malignancies in BIRDEM General Hospital.

Oncologic emergencies can occur at any time during the course of malignancy, from presenting symptom to the end stage of the disease.¹ In addition, the emergency may also arise from the side-effect of anticancer treatment administered to the patient.³ Efficient diagnosis and proper management of life-threatening complications may facilitate either definitive treatment of the underlying malignancy or palliation.⁴ There are few studies in our country about cancer patients but there is no study showing its relation to glycemic status and documentation of oncologic emergencies.

In this study 114 cases of cancer patients were encountered among which 23 cases of oncologic emergencies were documented. As this hospital mainly serves diabetic patients, two-third of the cases were found to be diabetic (17, 73.91%). Eight types of oncologic emergencies were encountered during this period occurring in 11 different categories of malignancies. These emergencies occurred in different phases of the malignancies, even after/during treatment.

Among the emergencies, marrow failure, neutropenic sepsis and hypercalcemia together were 15 cases, reflecting 65.22% of the total oncological emergencies found. It was also observed that marrow failure, neutropenic sepsis, hypercalcemia and SIADH were more common in the diabetic group. This correlates the common oncological emergencies mentioned in textbook of oncology, 'Handbook of Cancer Chemotherapy' (Lippincott Williams & Wilkins).⁵

Age group distribution showed that 82.61% (19 cases) were in 41-60 years and 60 years above groups. This nearly correlates to the statistics of Bangladesh Cancer Registry Report.⁶ The mean age of the diabetic group was 59.06 years and that of the non-diabetic group was 35.67 years with a total mean age 52.96 years.

Patients coming from urban and sub-urban background (20 cases) reflected 87% of the study sample. This indirectly reflects the economic status of the admitted patient in BIRDEM and their ability to attain care at a tertiary care hospital level. In this study it is also noteworthy that all diabetic patients had co-morbidities whether single or multiple. On the other hand, none of the non-diabetic patients had any co-morbid conditions ($p = 0.002$).

Clinical features during oncologic emergencies 6 cases (26.09%) had 'more than one' features of whom 5 were diabetic (5, 21.74%). Other clinical features were according to the different diagnoses of malignancies. The common malignancies in this study were leukaemia, carcinoma lung, pancreatic carcinoma, multiple metastasis followed by carcinoma uterus/cervix, lymphoma and multiple myeloma. In Bangladesh, according to a large study on cancer patients conducted in National Institute of Cancer Research and Hospital of Bangladesh, the common cancers in adult males included cancers of lung, lymphatics, larynx, oral cavity and

skin, while in adult females breast, cervix, lung, oral cavity, lymphatics and ovarian cancer were common.⁷

The outcome among the 23 cases were variable. Recovery rate from oncologic emergencies was low (13.04%) in the diabetic group while a higher rate was observed in the non-diabetic group. Death, deterioration and non-responders were also more in the diabetic group. Similar observations were mentioned in a large retrospective cohort study of 112,408 patients which was carried out in more than 350 primary care practices in the United Kingdom. The study also stated that solid-tumor cancer was associated with shorter survival in people with type 2 diabetes.⁸ In our study, the number of lost from follow up cases were considerable (9, 39.13%) which was mostly due to the financial compromise to continue treatment including intensive care support and reluctance to continue further hospital stay owing to lack of optimistic improvement.

Conclusion:

Our study suggests that patients with malignancy and diabetes mellitus are more prone to develop oncological emergencies and are also associated with co-morbidities. Our hospital has abundant patients with diabetes mellitus and as such is an ideal place for such a study. Our study assessing the significance of glycemic status in oncological emergencies is the first reported study in Bangladesh. This is a small scale preliminary study and further study involving multi-centre with larger population is warranted.

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