Prevalence of diabetes mellitus among Non-Hodgkin's lymphoma patients admitted in Al-Sadqa Teaching Hospital during 2017

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Abstract

Non-Hodgkin's lymphoma (NHL) is a common hematological malignancy, it's incidence has been rising globally since the 1970s with an increasing prevalence of diabetes mellitus (D.M) and NHL, the number of patients suffering from both diseases is growing.

Among adult patients, regardless the gender, the second most common cancers among Yemeni population was NHL with 8.0%.

This is a descriptive record-based study of 42 NHL cases admitted to Al-Sadqa Teaching Hospital, National Oncology Center - Aden, from 1st January to 31st December 2017, to identify the prevalence of D.M among NHL patients.

In this study, there was 6.37% of patients admitted with NHL,11.9% of them with history of DM, the mean age was higher for patient with diabetes 62.6 $\pm$7.7, male patient percentage was higher with 13.6% and obesity with 42.9 % among patients for NHL and D.M.

In this study, 76.8 % of patients treated by CHOP (cyclophosphamide, doxorubiicin, vincristine and prednisone) regime with only adjustment of prednisolone dose for diabetes patients.

This study provided, for the first time, the prevalence of diabetes among NHL patients.

Keywords: NHL, D.M, Prevalence

Introduction

Non-Hodgkin's lymphoma (NHL) is a common hematological malignancy. [12] It's incidence has been rising globally since the 1970s.[6]

Non-Hodgkin lymphoma is a heterogeneous group of B-cell and T-cell neoplasm that arise primarily in the lymph nodes with varied clinical and biologic feature. [16]

NHL represented 2.7 % of all cancers and 2.4 % of all deaths from cancer worldwide.[9] Yemeni population was NHL with 8.0%.

Among adult patients and regardless the gender, NHL is the second most common cancers after breast cancer. [1]

Diabetes mellitus is among the most prevalent and morbid chronic diseases affecting the health of millions of persons worldwide. . [10]

Prevalence of diabetes 435 million persons in 2015. [7]

In Yemen with an approximate population of 23 million, the prevalence of DM is estimated to be 9.75% in individuals aged 20-years-old and older. [3]

DM2 has been studied as a potential risk factor for the development of hematologic malignancies. They found a stronger association for DM2 and non-Hodgkin lymphoma (NHL). [5] It is associated with altered immune function and chronic inflammation. Chronic inflammation may promote lymphogenesis through the effects of pro inflammatory cytokines on lymphocyte proliferation and survival. Both of these immune conditions are implicated in the pathogenesis of non-Hodgkin lymphoma. Reports of excess non-Hodgkin lymphoma risk among diabetic patients dated back to two decades ago. In recent years, the number of studies that have examined the relation between type 2 diabetes mellitus and malignancy has surged because of an increased interest in hypotheses linking hyperinsulinemia to malignancy. [6]

Hyperinsulinemia, hyperglycemia, inflammatory cytokines over secretion, insulin-like growth factor (IGF) overproduction, and up-regulation of IGF-1 receptor are phenomena seen in patients with DM2 that would favor not only malignant transformation of cells but also progression of tumors. 5

Type 2 diabetes mellitus and non-Hodgkin lymphoma may have common causes such as age, adiposity, lifestyle factors, correlates of socioeconomic status, and certain medical conditions.[6] Epidemiologic studies indicate that environmental factors may play an important role in the etiology of non-Hodgkin's lymphoma .[11]

Objectives
1. To identify the prevalence of NHL patients admitted to hospitals.
2. To assess the frequency of diabetes mellitus among NHL patients.
3. To identify the relation between age, sex and obesity between patients with and without diabetes in NHL.

Patients and methods:
This is a descriptive record-based study of 47 patients admitted with NHL and the record of five patients, out of them, did not fulfill the requirements. All the patients were diagnosed by pathologist in Al-Sadqa Teaching Hospital, National oncology center, Aden, from 1ˢᵗ January to 31ˢᵗ December 2017.

Information was taken from record after getting permission from authorities of the hospital.

Inclusion criteria: all records of cancer and diagnosed of NHL have fulfilled requirements.

Exclusion criteria: record with missing data.

Patients' data were analyzed using frequency distributions for quality variable and mean for quantitative.

Obesity [body mass index (BMI), weight (kg)/height (m2) >30]. [13]

To assess the association among variables mean standard deviations ($\pm$ SD) were computed and Chi- square test ($x2$) was used to analyze differences between qualitative variables and compare mean for quantities variable and applied to find out the statistical significance by computerized system. A P value of $< 0 .05$ was used as a cutoff for statistical significance. All the statistical analyses (Data processing) were performed using the computer facilities Statistical Package for the Social Sciences (SPSS version 23) .

Result:
Patients admitted with NHL in this study for a period of one year in National Oncology center at 2017 were 42 with 6.35 % among 661cancer case.
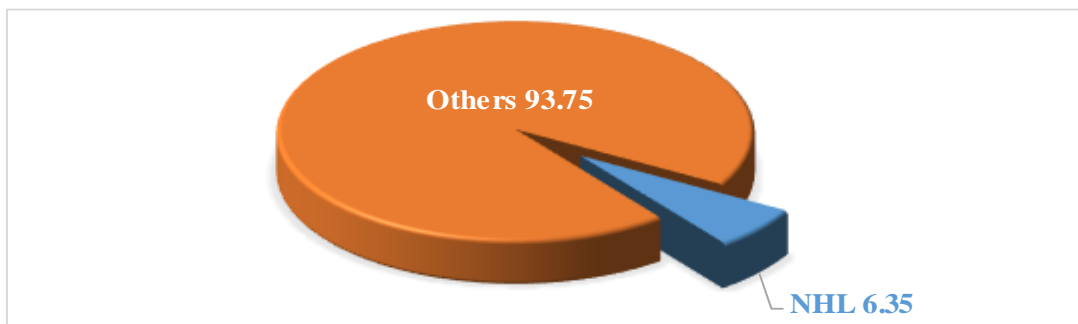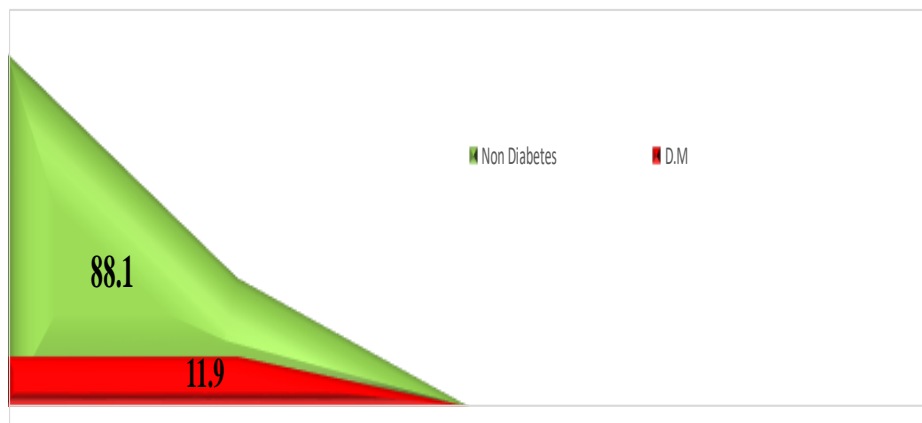

Figure 1 : Distribution of patient with NHL and other cancer patients admitted to hospital

In figure (2) Diabetes mellitus was only five patients with 11.9% among 45 NHL

Table 1: Mean age of NHL patient with diabetes.

Diabetes mellitus	Mean age by years	P. value
Yes	62.6 غ 7.7	
No	51.1 غ 17.4	0.014
Total	52.43غ 16.58	

Table 1 shows the mean age for patients with and without diabetes (62.6 غ 7.7 &51.1 غ 17.4) respectively with statistically significant relation p= 0.014

Table 2: distribution of NHL patient with diabetes according to sex.

Sex	D.M		Not diabetes		Total	
	No	%	No	%	No	%*
Male	3	13.6	19	86.4	22	52.4
Female	2	10.0	18	90.0	20	47.6
Percentage calculated by raw * Percentage calculated by column P = 0.547						

Table 2 shows male more than female with diabetes (13.6% vs 10 %) with no statistically significant p= 0.547

Table 3: distribution of NHL patient with diabetes according to body weight.

Obesity	D.M		Not diabetes		Total	
	No	%	No	%	No	%*
Yes	5	42.9	4	57.1	7	16.7
No	0	0	28	100	28	66.7
Percentage calculated by raw * Percentage calculated by column P = 0.02						

Table 3 shows all patients with diabetes are obese and, among obesity patients, 42.9 are diabetes

Discussion:

In recent decades, there has been a dramatic increase in NHL incidence worldwide, about 2,4% annually, while for most cancers incidence and mortality are decreasing. The incidence rates of all subtypes of NHL have increased during the second half of the twentieth century, but the reason is poorly understood. [11]

NHL is the third one, among five most common cancers in Aden, were breast cancer, leukemia, non-Hodgkin's lymphomas, brain cancer and Hodgkin's disease. [4]

In this study, 47 patient admitted with NHL and 5 of them their record not fulfil requirements, total number with complete data was 42 patients with 6.35 % of all cancer patient in Figure (1)admitted to the hospital in study period which near to what reported in Baslem et al[4] with 7.8 % .

There is a positive relation between the history of type 2 diabetes mellitus and subsequent risk of non-Hodgkin lymphoma. [6]

In Figure (2), among patient with NHL in this study, there was 11.9% of them with history of diabetes mellitus which is lower than reported by Tesng et al [15] with 27.5 % of NHL patients have diabetes.

DM2 and cancer share common risk factors, such as age, sex, overweight and obesity, waist-to-hip ratio, physical activity, dietary habits, smoking, and alcohol intake, making it difficult to discern the oncogenic effect of each specific risk factor. [5]

As with most cancers, the probability of being diagnosed with hematological malignancy increases markedly with age. In Western countries, it usually affect older people.[9] The frequency of NHL increases with advancing age.

Worldwide, longer life spans have led to increases in morbidity and mortality because of chronic, lifestyle-influenced diseases that may include cancers such as non-Hodgkin lymphoma (NHL). [13]

If we look to the mean age of patient with NHL it was 52.43 t16.58 years which is near to what reported by Tseng H with 59.7 t 11.4 years. [15]

In this study, the mean age was higher for patient with diabetes (62.6 t 7.7) and significant relation found between them (p= 0.014).

Which was more common in male than in female. [9, 14] Of all non-Hodgkin's lymphoma cases 59% were males and 41% were females. [1]

In this study, regarding to sex ,male where more than female 52.4% which is near to what reported by Tseng et al[15] 49.7 %, [15] while in relation to diabetes they were also higher in male than female with 13.6% vs 10.0% respectively with no significant relation appearing between them (p= 0.547) .

Both T2D and NHL are strongly correlated with socio economic state including occupation, family income, education levels, and obesity. [17]

Based on a number of case-control and prospective cohort studies, overweight/obesity likely increases the risk of NHL, [13]. DM and obesity has already become a worldwide epidemic, [2] and the Eastern Mediterranean region had one of the highest prevalence of obesity worldwide, while in Yemen, the prevalence of DM is estimated to be 9.75% in individuals aged 20-years-old and older.[3] Obesity is prevalent in patients with type 2 diabetes Mellitus [8] a positive association between obesity and non- Hodgkin lymphoma has been suggested. [6] which can be seen clearly in this study in which patient with obesity was 33.3% in NHL, while in patients with diabetes it was 35.7% .

In this study, 76.8 % of patients were treated by CHOP regimen with only adjustment of prednisolone dose for diabetes patients while in other study 70% treatment regimen consisted of CHOP (no difference between patients with and without diabetes) were subsequently treated with lower dose-intensity of Adriamycin and vincristine, compared to NHL patients without diabetes. [16]

This study provided, for the first time, the prevalence of diabetes among NHL patients, which need further study with large sample size.

Conclusion

The frequency of NHL increases with advancing age ,is more common in males and strongly correlated with obesity.

Acknowledgments

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معدل انتشار مرض السكري بين مرضى سرطان الغدد الليمفاوية الغير هودجكين المرقدين بمستشفى الصداقة التعليمي خلال الفترة 2017م

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المُلخص

سرطان الغدد الليمفاوية الغير هودجكين هو سرطان خبيث دموي شائع، وظهوره قد ارتفع على الصعيد العالمي منذ 1970م ومع تزايد انتشار مرض السكري وسرطان الغدد الليمفاوية الغير هودجكين، فإنَ عدد المرضى الذين يعانون منهما ينمو.

ومن بين المرضى البالغين بغض النظر عن نوع الجنس، كانت ثاني أكثر أنواع السرطان شيوعا بين السكان اليمنيين هي سرطان الغدد الليمفاوية الغير هودجكين بنسبة 8.0٪.

إنّ هذه الدراسة وصفية قائمة على السجل لـ42 حالة في مستشفى الصداقة التعليمي، المركز الوطني للأورام - عدن، ابتداء من 1 يناير إلى 31 ديسمبر 2017، لتحديد انتشار مرض السكري بين مرضى سرطان الغدد الليمفاوية الغير هودجكين.

وفي هذه الدراسة، كان هناك 6.37٪ من مرضى سرطان الغدد الليمفاوية الغير هودجكين بالنسبة لكافة الحالات المرقدة، 11.9٪ منهم مصابون بمرض السكري ومتوسط اعمارهم كان أعلى لمرضى السكري 62.6 غ 7.7. وكانت النسبة أعلى بين الذكور 13.6٪ والبدانة مع 42.9٪ بين مرضى سرطان الغدد الليمفاوية الغير هودجكين.

في هذه الدراسة كان 76.8٪ من المرضى الذين يعالجون من قبل نظام العلاجي شوب CHOP مع تعديل بجرعة البريدنيزولون لمرضى السكري.

قدمت هذه الدراسة لأول مرة انتشار مرض السكري بين مرضى سرطان الغدد الليمفاوية الغير هودجكين.

الكلمات المفتاحية: مرض السكري, سرطان الغدد الليمفاوية الغير هودجكين, معدل انتشار