Complications For Bone Marrow Transplant Patients

مشاكل مرضى زرع نخاع العظم

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الخلاصة
الهدف:- تقييم مدى أنتشار المشاكل الجسمية وعلاقتها بالحالة الصحية والوظيفية للمرضى البالغين
المنهجية:- تحليل المشاكل ل ١٣ مريض ممن أجري لهم زرع النخاع الذاتي وللفترة من حزيران ٢٠٠٨ ولغاية كانون الأول ٢٠١٢ في المركز التخصصي لزرع نخاع العظم – مدينة الطب. تم جمع المعلومات من خلال المتابعة اليومية للمرضى وتسجيل كافة المعومات الطبية والسريرية . تم تحليل النتائج أحصائيا بأستخدام الأحصاء الوصفي (التكرار، النسبة المئوية ، متوسط النتيجة ، مربع كاي)
النتائج:- بشكل عام كشفت الدراسة لا توجد علاقة أحصائية معنوية بين العمر والجنس وأيضا التشخيص السريري مع الجنس وأيضا عدد فصول العلاج الكيميائي مع التشخيص السريري لانه (P≥0.05). (٥٣.٨٤%) كانوا من الذكور أكثر من الأناث (٤٦.١٥%)، أعمار المرضى في الدراسة كان بين (٢٢-٢٧)سنة في (٣٠.٧٦%). (٥٣.٨٤%) متزوجين. (٣٠.٧٦%)طلاب. تاريخ عائلي أيجابي تجاه الأصابة بالأمراض السرطانية في (٦١.٥٢%). مرض لاهودجكن اللمفاوي مشخص في (٥٣.٨٤%). ثلاثة فصول مستلمة من العلاج الكيميائي في (٣٨.٤٦%). الخلايا الجذعية المحصودة كانت من الخلايا المحيطية (٦١.٥٢%). أسبوع بدع عمل النخاع كان واضح في الأسبوع الرابع (٥٣.٨٤%). علاقة أحصائية معنوية واضحة بين التشخيص السريري مع مصدر الخلايا الجذعية لانه (P≤0.05). ألتهاب الغشاء المخاطي للفم واضح في المستوى الرابع (٦٠%). مدى أنتشار المشاكل للمرضى الذين أجري لهم زرع النخاع الذاتي كان فوق نقطة القطع، متوسط النقطة كان (٢) صداع، كأبة،تغير في الطعم،جفاف الفم، نزف الفم ، فقدان الشعر ، والحمى . (١.٩٢) غثيان وتقيء. (١.٧٦)فقدان الشهية، أحمرار الجلد. (١.٦١) أمساك.
التوصيات:-أوصت الدرلسة بأعداد برنامج تثقيفي للمرضى وأيضا للكادر التمريضي في تقديم أفضل عناية تمريضية لمرضى زرع النخاع وكيفية التعامل معهم وتزويد المرضى بكراس يوضح كيفية العناية الفموية والجسمية لتقليل المخاطر.

Abstract
Objective: - Our objective to assess the prevalence complications & their association with health & functional status

Methodology: - Analyses complications of thirteen patients underwent autologous bone marrow transplant from June 2008 to December 2010 at bone marrow transplant specialty center in Baghdad Medical City; data were derived from daily follow-up and record to all clinical and medical information's.

Results: - No statistically significant association was found between ages with gender, also clinical diagnosis with gender, & number courses of chemotherapy with clinical diagnosis (P≥0.05). Especially (53.84%) were males which more than females (46.15%), the patient's age in the study was between with mean of 22-27 yrs. (53.84%) married, (30.76%) student, positive family history toward malignant disease in (61.52%), Non-Hodgkin Lymphoma diagnosed in (53.84%), 3 courses chemotherapy receiving in (38.46%), harvested stem cell was peripheral stem cells in (61.52%), week engraftment present was in 4 weeks in (53.84%). Statistically significant association was found between clinical diagnoses with source of stem cells (P≤0.05). mucositis was in grade 4 in (60%). The cumulative prevalence of any complications underwent transplant was above cut-off point, mean of score was (2) headache, depression, change in test, dry mouth, oral bleeding, hair loss, fever, and (1.92) nausea, vomiting, (1.76) anorexia, flushing skin, while (1.61) constipation.

Recommendations: - the study recommended preparation health education program for patients and nursing staff to give best nursing care for bone marrow transplant patients and how communication with them, & booklet provided for all patient show how to oral hygiene and personal hygiene to reduce risk reduction.

INTRODUCTION

Hematopoietic stem cell transplantation has become an increasingly important treatment modality for hematologic malignancies. The first successful bone marrow transplant was done in 1968. It was not until nearly 29 years later that stem taken from the blood stream (peripheral blood) was transplanted, with success. Steam cells transplants are used to replace bone marrow that has been destroyed by diseases, chemo or radiation. In some diseases, like leukemia, aplastic anemia, certain inherited

blood diseases & some diseases of immune system, the steam cells in the bone marrow don't work the way they should, in some cancers, such as leukemia, multiple myeloma, and some lymphoma, a steam cells transplant can be an important part of treatment. There are 3 possible sources of steam cells to use for transplants, bone marrow & blood stream (peripheral blood), umbilical cord blood from new borne. There are 3 basic types of transplants; they are named based on where the stem cells come from; autologous, allogeneic; and syngeneic. In 2009, there were 20,580 new cases of multiple myeloma resulting in 10,580 deaths. If untreated, the median survival for symptomatic patients is approximately 1 year. The prognosis of the patients with multiple myeloma has not changed markedly since the introduction of melphalan and prednisone about 25 years ago. The type of problems that can happen after transplant depend on many factors, such as the type of transplant done, the conditioning treatment used, the patient's age at the time of transplant, the length and degree of immune system suppression. The problems can be caused by the conditioning treatment (the pre-transplant chemo or radiation therapy), especially total irradiation, or by other drugs used during transplant (such as the drugs that may needed to suppress the immune system after transplant. Some of these problems can be life-threatening.

PATIENTS AND METHODS

In bone marrow transplant specialty center in Baghdad Medical City, prospective study was designed to estimate the prevalence physical complications in thirteen patients (seven males, six females)underwent autologous bone marrow transplantation from June 2008 to December 2010. All consecutive patients who had single bone marrow transplant, intensive therapy and autologous, patients were diagnosed lymphoma, myeloma, rahabdo sarcoma. Harvested stem cell from peripheral stem cells & bone marrow, normally few stem cells are found in the blood, but giving hormone like substances called growth factors to stem cells, a few days before the harvest causes their stem cells to grow faster and move from the bone marrow into the blood, in this way the stem cells are taken from blood, by insert very thin flexible tube (called catheter) is put into one patients vein and attached to tubing that carries the blood to special machine, this machine separate the blood duration 2 to 4 hours, and keep only stem cells, while harvested stem cells from bone marrow, collected under general anesthesia. The stem cells are filtered and stored in bags, and frozen until patients are ready for them. Patients admission isolated room after finish harvested of stem cells to start protocol hydration therapy, these include (10000 cc normal saline + 10 mEq KCL) duration forty eight hours, after second hours patients received malaphlan by catheter vein line twenty minute duration, to destroyed any malignant cells found in the body, and then Lasix eighteen mg, and continue hydration to end. After finish hydration therapy return stem cells by vein needle. Questionnaire contained the information contain from fifteen items, & the scale was Yes (2) & No (1).Demographic information are variables; age, gender, family history & marital status & occupational. Clinical information includes; diagnosis, number courses of chemotherapy, sources of stem cells, week of engraft. Mucositis assessed according to W.H.O scale. Use descriptive statistical analyses (frequency, percentage, mean of score, chi square).

RESULTS

Table 1: Distribution of patients according to age and gender & correlation coefficient between them

Age group years	No.	%	Gender				C.S. P-value
			Males		Females		X^2 =4.807 df = 7 non-significant P≥0.05
			No.	%	No.	%	
10 – 15	1	7.69	0	0	1	7.69	
16 – 21	2	15.38	1	7.69	1	7.69	
22 – 27	4	30.76	2	15.38	2	15.38	
28 – 33	1	7.69	0	0	1	7.69	
34 – 39	1	7.69	1	7.69	0	0	
40 – 45	2	15.38	1	7.69	1	7.69	
46 – 51	1	7.69	1	7.69	0	0	
52 – 58	1	7.69	1	7.69	0	0	
Total	**13**	**99.99**	**7**	**53.84**	**6**	**46.15**	

Table (1)Describe the characteristics of sample, (53.84%) were males while (46.15%) were females, the age of entire sample present in (22-27) years (30.76%), a non-significant difference between age & gender in patients.

Table 2: Marital status for patients

Categories	No.	%
Married	7	53.84
Single	5	38.46
Widowed	1	7.69
Total	13	99.99

Table (2) regarding to the patients marital status, the majority of the sample are married and they accounted for (53.84%) of the whole sample, (38.46%) were single, and widowed (7.69%).

Table 3: Occupational status for patients underwent bone marrow transplant

Categories	No.	%
Employ	3	23.07
Non employ	3	23.07
Office manager	1	7.69
House wife	2	15.38
Student	4	30.76
Total	**13**	**99.99**

Table (3) the majority of sample were student (30.76%), employ and non-employ were equal in quarter (23.07%), office manager (7.69%), while house wife (15.38%).

Table 4: Family history in the study groups

Categories	No.	%
Positive	8	61.52
Negative	5	38.45
Total	13	99.97

Table (4) family history toward malignant diseases present in (61.52%) as positive, while negative in (38.45%)

Table 5 Clinical diagnosis with gender distribution & correlation coefficient between them

Diagnosis	No.	%	Gender				C.S. P-value
			Males		Females		X^2 =4.155
			No.	%	No.	%	df = 2
Myeloma	5	38.46	1	7.69	4	30.76	non-significant
N.H.L*	7	53.84	5	38.46	2	15.38	P≥0.05
R.S**	1	7.69	1	7.69	0	0	
Total	**13**	**99.99**	**7**	**53.84**	**6**	**46.15**	

***N.H.L: Non-Hodgkin Lymphoma**
****R.S: Rahabdo Sarcoma**

Table (5) the number of patients with clinical diagnosis was significantly higher in Non-Hodgkin's Lymphoma was (53.84%), (38.46%) were males, while females were (15.38%), a non-significant difference between clinical diagnosis & gender distribution.

Table 6 Number courses of chemotherapy with clinical diagnosis & correlation coefficient between them

Number of courses	No.	%	Clinical diagnosis						C.S. P-value
			Myeloma		N.H.L		R.S		X^2 =4.155
			No.	%	No.	%	No.	%	df = 8
1	1	7.69	0	0	0	0	1	7.69	non-significant
2	4	30.76	1	7.69	3	23.07	0	0	P≥0.05
3	5	38.46	3	23.07	2	15.38	0	0	
4	1	7.69	0	0	1	7.69	0	0	
5	2	15.38	1	7.69	1	0	0	0	
Total	**13**	**99.98**	**5**	**38.46**	**7**	**46.15**	**1**	**7.69**	

Table (5) the numbers of courses of chemotherapy were three courses receiving in (38.46%), myeloma was (23.07%) and Non-Hodgkin lymphoma was (15.38%), a non-significant difference between number courses of chemotherapy & clinical diagnosis.

Table 7: Clinical diagnosis with source of stem cells & correlation coefficient between them

Clinical diagnosis	No.	%	Source				C.S. P-value
			P.B***		B.M.A****		X^2 = 6.027
			No.	%	No.	%	df = 2
Myeloma	5	38.45	5	38.45	0	0	Significant
N.H.L	7	53.84	3	23.07	4	30.76	P≤0.05
R.S	1	7.69	0	0	1	7.69	
Total	**13**	**99.98**	**8**	**61.52**	**5**	**38.45**	

*****P.B: Peripheral Blood**
******B.M.A: Bone Marrow Aspiration**

Table (7) Source of stem cells harvested from peripheral blood were (61.52%), especially in multiple myeloma was (38.45%), while in Non-Hodgkin lymphoma was (23.07%), significant association between source of stem cells and clinical diagnosis

Table 8: Day engraftment with clinical diagnosis & correlation coefficient between them

Day engraftment	No.	%	Clinical diagnosis												C.S. P-value
			Myeloma				N.H.L				R.S				X^2 =4.155 df = 2 non-significant P≥0.05
			P.B		B.M.A		P.B	B.M.A			P.B		B.M.A		
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	
3 weeks	6	46.15	0	0	0	0	1	7.69	4	30.76	0	0	1	7.69	
4 weeks	7	53.84	5	38.45	0	0	2	15.38	0	0	0	0	0	0	
Total	**13**	**99.98**	**5**	**38.45**	**0**	**0**	**3**	**23.07**	**4**	**30**	**0**	**0**	**1**	**7.69**	

Table (8) Week engraftment present in four week in (53.84%), high in multiple myeloma especially in peripheral blood stem cell was (38.45%), while in Non-Hodgkin lymphoma in the same source was (15.38%), a non- significant differences between week engraftment with two variable clinical diagnosis and source of stem cells

Table 9: Complications for patients underwent bone marrow transplant

Complications	Yes (2)		No (1)		M.S
	No.	%	No.	%	
1- Fatigue	5	38.46	8	61.53	1.38
2- Headache	13	100	0	0	2
3- Depression	13	100	0	0	2
4- Insomnia	5	38.46	8	61.53	1.38
5- Anorexia	10	76.92	3	23.07	1.76
6- Nausea	12	92.30	1	7.69	1.92
7- Vomiting	12	92.30	1	7.69	1.92
8- Constipation	8	61.53	5	38.46	1.61
9- Change in taste	13	100	0	0	2
10- Dry mouth	13	100	0	0	2
11- Oral bleeding	13	100	0	0	2
12- Hair loss	13	100	0	0	2
13- Local infection	8	61.53	5	38.46	1.61
14- Fever	13	100	0	0	2
15- Flushing skin	10	76.92	3	23.07	1.76

Table (9) Physical complications are estimated average cut-off points of all items (1.5) were measured on 2 level liker rating scale Yes (2) and No (1), (100%) patients toward headache, depression, change in test, dry mouth, oral bleeding, fever, answer yes, mean of score (2), (92.30%) patients answer yes, while (7.69%) answer no, toward nausea, vomiting, mean of score (1.92), (76.92%) answer yes, while (23.07%) answer no, toward anorexia, flushing skin, mean of score was (1.76). (61.53%) answer yes, while (38.46%) answer no, toward constipation, local infection, mean of score was (1.61).

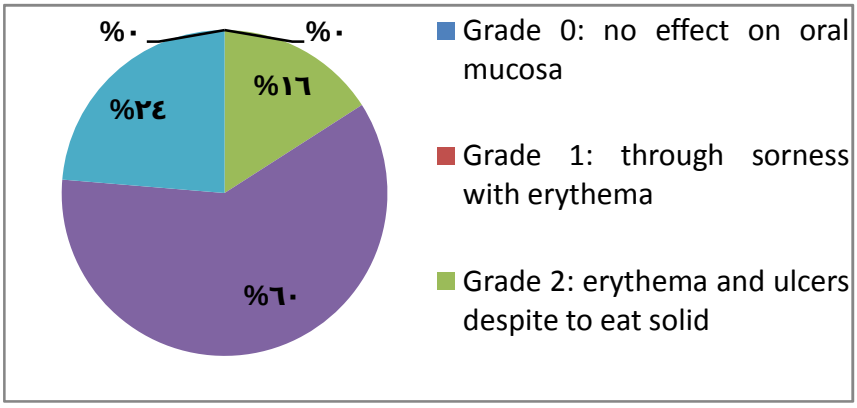

Figure 1: Assess Mucositis according to W.H.O Scale

Figure (1) Mucositis present in (60%) was in grade 3

DISCUSSION

Autologous hematopoietic stem cells transplant is an effective and curative treatment for various types of malignant and non-malignant diseases [1]. In this study the for patients present with N.H.L (22-27 yrs.) in half sample, which agreed with (American Cancer Society 2004) their defined two peaks in the age distribution that observed for this cancer type the first peak occurs in young adult between the age 15 – 40 yrs.[2,7,4]. In this study males predominance has been observed for lymphoma patients with Devesa& fears, 1992 they stated the lymphoid cancers are more frequent in males more than females through all age group and across virtually all cancer registries in developed countries [8, 9] .family history positive toward malignant diseases, most lymphoma come inherited mutation in the genes of growing blood cells [5, 6]. Hematopoietic stem cell transplantation for non-Hodgkin lymphoma (NHL) has been mainly performed using an autologous graft, because this incidence of treatment, related mortality after allogeneic transplantation is as high as 57% [3, 10]. In some cancers such as certain leukemia, multiple myeloma, & some lymphoma a stem cell transplant can be an important part of treatment, it works likes this high dose of chemotherapy or radiotherapy work better than slandered doses to kill cancer cells [11, 12]. Peripheral stem cells, normally, few stem cells are found in the blood but giving hormone like substances called growth factor to stem cells, days before the harvested causes her stem cell to the growth factor & move from bone marrow in the blood [13, 15]. At first stem cells transplant, when bone marrow transplant but to day peripheral blood stem cells transplant much more common [14, 16]. Approximately two to four weeks after your transplant you can expect to see signs of your bone marrow "engrafting" or beginning to grow, the first sign of this is production of white blood cells [17, 18, and 19]. Platelets after take little longer to begin developing [21, 23]. Once you have "engrafted" & your condition is stable, you will be discharged from the hospital, there over time, they engraft or "take" and begin to make blood cells [22, 25]. Signs of the new blood cells usually can be measured in the patient's blood tests in about 2 to 4 weeks [27, 28 and 29]. Preserving agent used when freezing the cells (called dimethyl sulfexide or DMSO) causes side effect in gastrointestinal system [29, 30]. Oral cavity is a frequent site of therapy related complications; mucositis is specific problems for the effects and appearance in mucosa membrane epithelial for mouth and the incidence & severity of mucositis have been related to the degree of the preexisting mucosal disease, oral hygiene & nature of therapy [13, 30]. During the first couple of weeks you will have low number, of red & white blood cells & platelets [23, 29]. Right after transplant, when you counts are the lowest, you may be giving antibiotics to help keep you from getting infections (this called prophylactic antibiotics) [17, 18]. You may get a combination of

antibacterial, anti-fungal, & antiviral drugs [5, 10]. These are usually given until, your white blood cells reaches a certain level [11, 20]. Still, you can have problems, such as infection from two few white blood cells (neutropenia), or bleeding from too few platelets (thrombocytopenia), many patents have high temperature & need I.V antibiotics to treat serious infections [17, 20]. Transfusion of red blood cells and platelets, are given until the bone marrow is working again & new blood cells are being made by the infused stem cells [22, 30].

CONCLUSIONS

Major complications present in hematopoietic & immune system, oral manifestations present in salivary gland dysfunction, gum inflammation & ulcer, mucositis

RECOMMENDATIONS

1. Nurse should carry on all nursing care & continuously follow up of the patients
2. Nurse exigency responsible for nutrition program for patients
3. Health education program for all patients in oncology unit is very necessary for risk determination & reduction
4. Provide booklet should be prepared for patient including the problems and side effect of chemotherapy and mouth care

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