بسم الله الرحمن الرحيم

Prognostic Significance of Anemia in Non-Hodgkin's Lymphoma Patients

Introduction

Malignant lymphoma represent a health problem throughout the world. It is the 5th common type of cancer and continue to increase rapidly. At NCI of Cairo among 10,556 cancer cases are seen in 2001, 855 patients (8%) had malignant lymphoma .

Introduction

This increasing incidence world wide may be explained by availability of better diagnostic tests and imaging techniques, aging of population and prevalence of environmental pesticides and viruses specially HIV.

Introduction

International co-operation effort has resulted in development of international prognostic index (IPI) to determine prognosis in patients with large cell lymphoma.

Introduction

IPI is based on age, performance status, serum LDH, stage and number of extra nodal sites. IPI has also been applied to patients with other types of NHL and appears to provide prognostic information in those types as well.

Introduction

Anemia is present in nearly 50% of lymphoma patients. The most common causes of anemia in NHL include anemia of chronic (ACD), autoimmune hemolytic anemia and lymphomatous infiltration of the bone marrow.

Introduction

Anemia is studied through this work to evaluate its importance as a prognostic factor in NHL. Anemia is defined in our study as Hb level less than 12 gm% for all men and for women over 50 years old and less than 11 gm% for women under 50 years of age.

Aim of the work

- To study the prevalence of anemia in NHL patients.
- To study different types of anemia in NHL.
- To study Hb level and RBCs indices at 0, 3& 6 cycles of chemotherapy.
- To evaluate the prognostic significance of baseline anemia in NHL patients.

Patients and Methods

- 100 patients with NHL (high and intermediate grade).
- Aged from 16 years up to 70 years.
- Recruited from the Medical Oncology Department at NCI, Cairo University.
- In the period from July 1995 to August 2003.

Patients and Methods

Inclusion Criteria:

- **Age (16 – 70 years)**
- **Sex (both sexes)**
- **Newly diagnosed**
- **Pathological type of intermediate and high grade NHL**
- **Treated at NCI of Cairo**

Patients and Methods

Exclusion criteria:

- Age (less than 16years, more than 70years)
- Relapsed patients
- Previously treated patients
- Pathological type of low grade NHL
- Treated outside NCI

Methods

Medical Records of eligible patients will be reviewed with special attention to these points:

1- Parameters of IPI including :

- **Age (whether more or less than 60y)**
- **LDH (whether more of less than 500 U /L)**
- **PS (whether good (PS 0,1,2) or bad (PS>2)**
- **Stage (whether high (III, IV) or low (I,II)**
- **Extra nodal site involvement (whether present or not)**

Methods

2- Hemoglobin level and RBCs indices (MCV, MCH & MCHC) : at 0,3 and 6 cycles of chemotherapy.

3- Treatment outcome including :

A- *Response* : weather CR or others which indicate treatment failure including partial response (PR), stable disease (SD), increasing disease & disease relapse during treatment .

Methods

B- *Relapse free Survival (RFS)* : which calculated from the time of diagnosis to the time of 1st relapse.

***C- Overall survival (OS)* : which means whether the patient is still alive or died.**

4- Follow up survival data : which means weather the patients are still under or lost follow-up

Results

Patients' characteristics

	%
Sex: males	52
females	41
Age: < 60 years	88
> 60 years	12
Stage:	
I	14
II	19
III	35
IV	32
IPI: low	34
high	66
IPI components:	
- Age > 60	12
- LDH > 500	64
- Stage > 2	67
- Extra nodal	67
- PS > 2	14

Patients' characteristics

Anemia (at baseline) : **Anemic** **Non anemic**	**40** **60**
Type of Anemia : **Normo, Normo** **Micro, Hypo** **Macro, Hyper**	**24** **15** **1**
Hb level (at baseline): **- <8 gm%** **- 8 – 10gm%** **- >10gm%**	**2** **13** **85**
Overall survival **- Alive** **- dead** **- lost follow up**	**70** **17** **13**

Distribution of anemia in patients with extra nodal site involvement.

Site	Total number	Extra nodal with anemia	Extra nodal without anemia
Bone	8	2	6
Bone marrow	5	3	2
GIT & liver	20	13	7
Lung & pleura	16	9	7
Head & neck	13	3	10
CNS	4	3	1
Others	11	5	6

Association between anemia at 0,3 and 6 cycles chemotherapy with IPI variables, treatment outcome and overall survival.

		Odds ratio	Confidence Interval	P value
Anemia $_0$	Age (>60)	1.58	0.41 – 6.16	>0.05
	LDH (>500)	1.29	0.51 – 3.26	>0.05
	Stage (>II)	1.12	0.44 – 2.85	>0.05
	Extra nodal	1.03	0.41 – 2.65	>0.05
	PS > 2	3.19	0.87 – 12.18	>0.05
	Response (bad)	1.91	0.77 – 4.77	>0.05
	Short RFS (<7months)	1.61	0.66 – 3.91	>0.05
	0S (Dead)	2.57	0.77 – 8-68	>0.05
Anemia $_3$	Response bad)	1.24	0.49 – 3.12	>0.05
	Short RFS (<7months)	1.81	0.75 – 4.38	>0.05
	0S (dead)	1.41	0.41 – 4.94	>0.05
Anemia $_6$	Response bad)	1.89	0.73 – 4.95	>0.05
	Short RFS (<7months)	1.53	0.63 – 3.76	>0.05
	0S (dead)	4.11	0.04 – 20.46	>0.05

Association between hemoglobin level less than 10 gm% at 0,3 and 6 cycles chemotherapy with IPI variables, treatment outcome and overall survival.

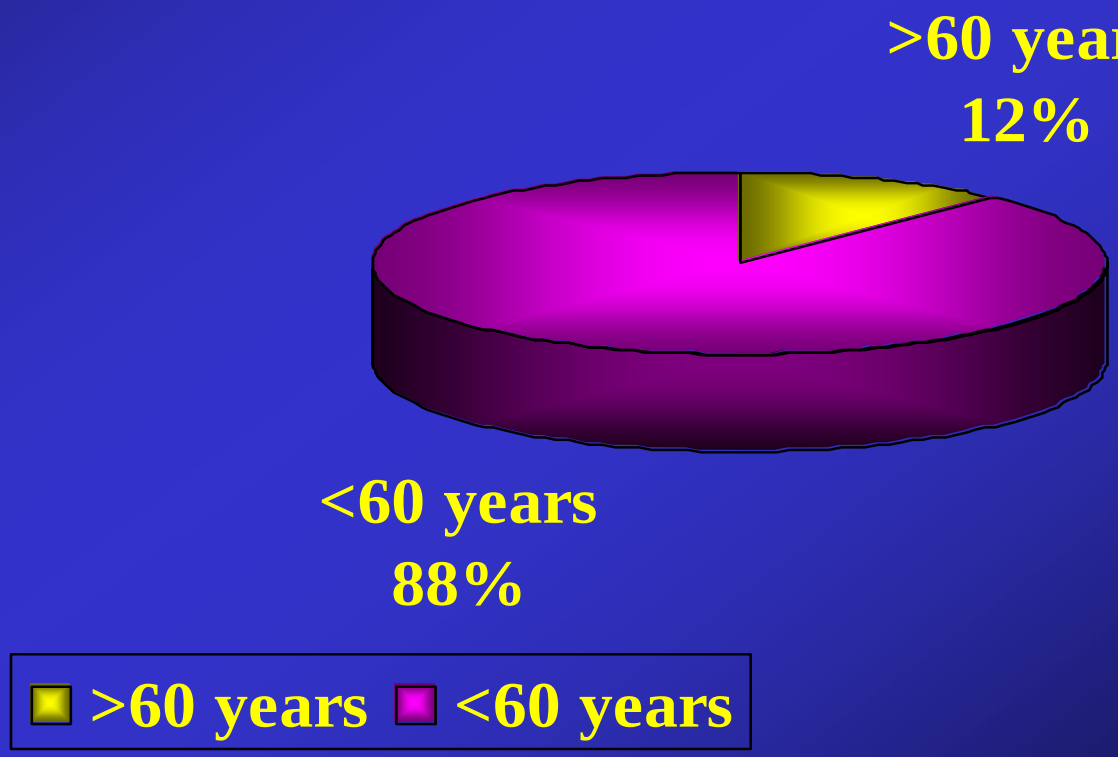
$Hb_0 \leq$ 10gm%		Odds ratio	Confidence interval	P value
	Age (>60)	2.11	0.39– 10.43	> 0.05
	LDH (>500)	1.66	0.44 – 6.81	>0.05
	Stage (>II)	3.93	0.76 -26.94	>0.05
	Extra nodal	2.18	0.52 -10.61	> 0.05
	PS (>2)	4.81	1.1 – 20.99	0.033 *
	Response bad)	3.6	1.03– 12.94	0.044 *
	Short RFS (<7months)	4.29	1.19 – 6.21	0.022 *
	OS (dead)	1.27	0.34 -4.63	> 0.05
$Hb_3 \leq$ 10gm%	Response bad)	2.25	0.78 – 6.5	> 0.05
	Short RFS (<7months)	1.98	0.68 – 5.82	> 0.05
	OS (dead)	0.98	0.29- 3.17	>0.05
$Hb_6 \leq$ 10gm%	Response bad)	4.67	1.48– 15.06	0.006*
	Short RFS (<7months)	2.19	0.71-6.91	>0.05
	OS (dead)	2.62	0.81-8.55	>0.05

Prognostic Significance of IPI variables and baseline anemia on treatment outcome.

		Odds ratio	Confidence interval	P value
Age	Response (bad)	1.31	0.33 – 5.14	>0.05
	Short RFS(<7months)	3	0.68 – 15.01	>0.05
	OS (dead)	0.21	0.01 – 1.68	>0.05
LDH	Response (bad)	1.78	0.68 – 4.73	>0.05
	Short RFS(<7months)	1.21	0.49 – 2.96	>0.05
	OS (dead)	0.77	0.26 – 2.24	>0.05
Stage	Response (bad)	5.14	1.62 – 17.29	0.003 *
	Short RFS(<7months)	0.39	0.28 – 1-75	>0.05
	OS (dead)	1.56	0.46 – 5.56	>0.05
PS	Response (bad)	2.76	0.77 – 10.09	>0.05
	Short RFS(<7months)	1.72	0.47 – 6.49	>0.05
	OS (dead)	0.71	0.14 – 3.08	>0.05
Extra nodal	Response (bad)	0.81	0.31 – 2.08	>0.05
	Short RFS(<7months)	1.09	0.44 – 2.73	>0.05
	OS (dead)	0.31	0.11- 0.91	>0.05
Anemia at presentation (baseline)	Response (bad)	1.91	0.77- 4.77	>0.05
	Short RFS(<7months)	1.61	0.66 – 3.91	>0.05
	OS (dead)	2.57	0.77 – 8.68	>0.05

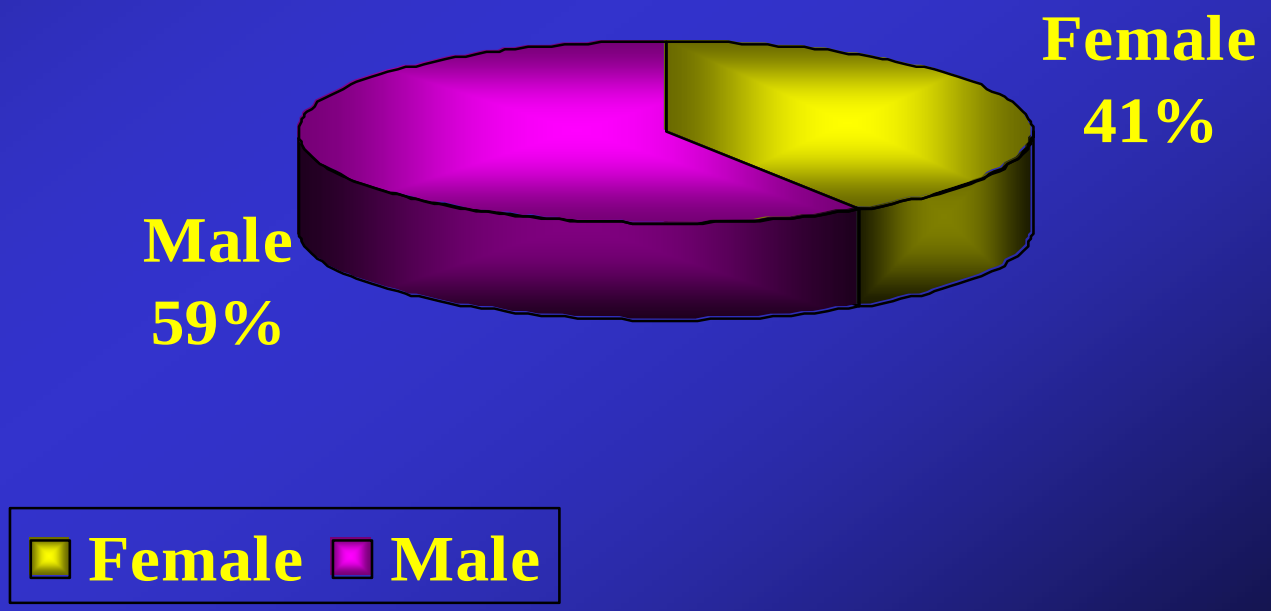
Results

Age distribution in studied patients.



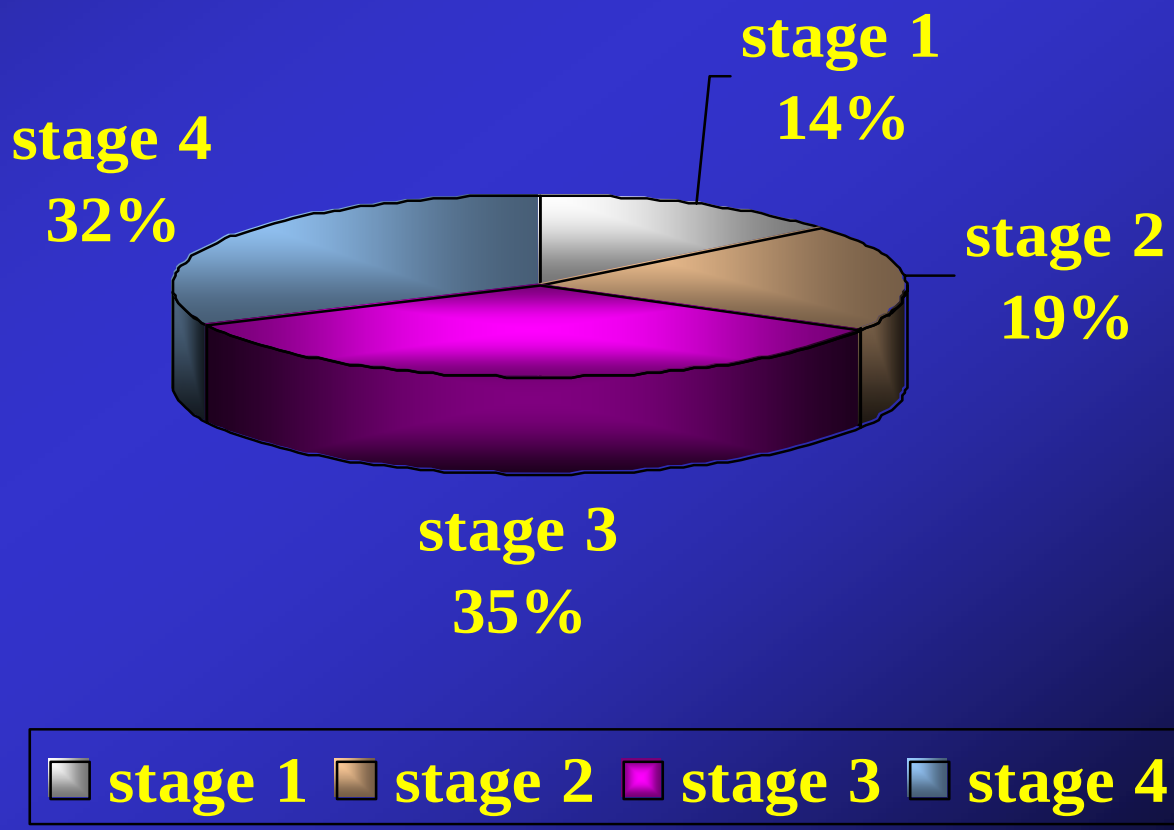
Results

Sex distribution in studied patients.



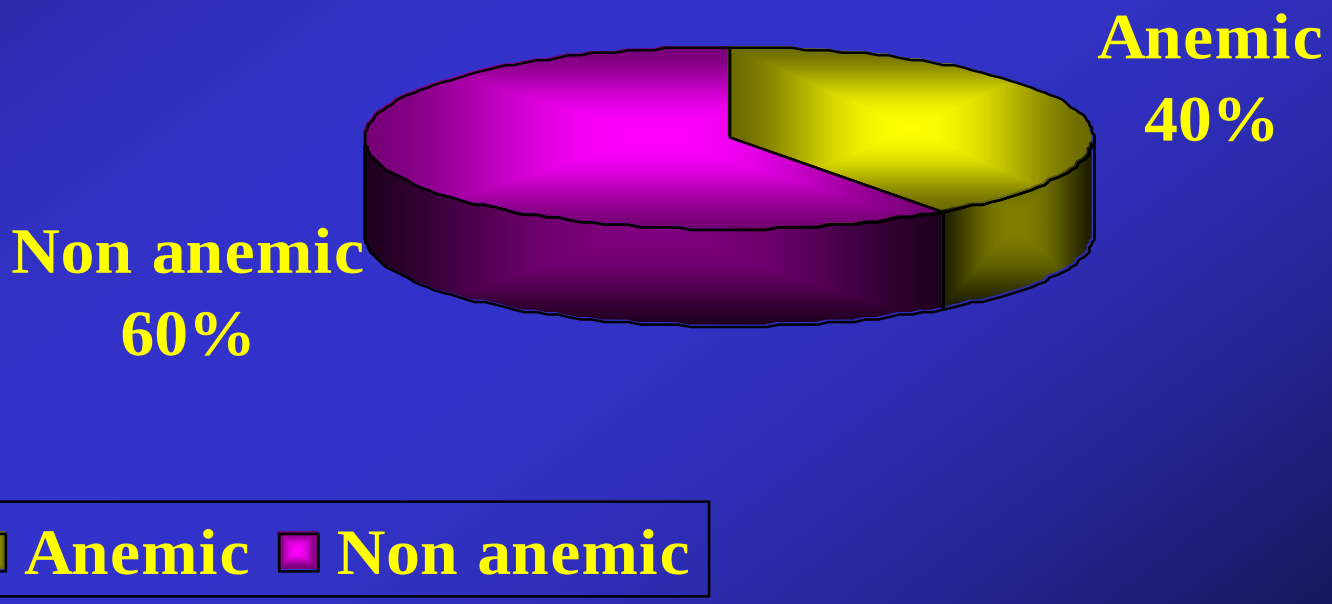
Results

Disease stage in studied patients.



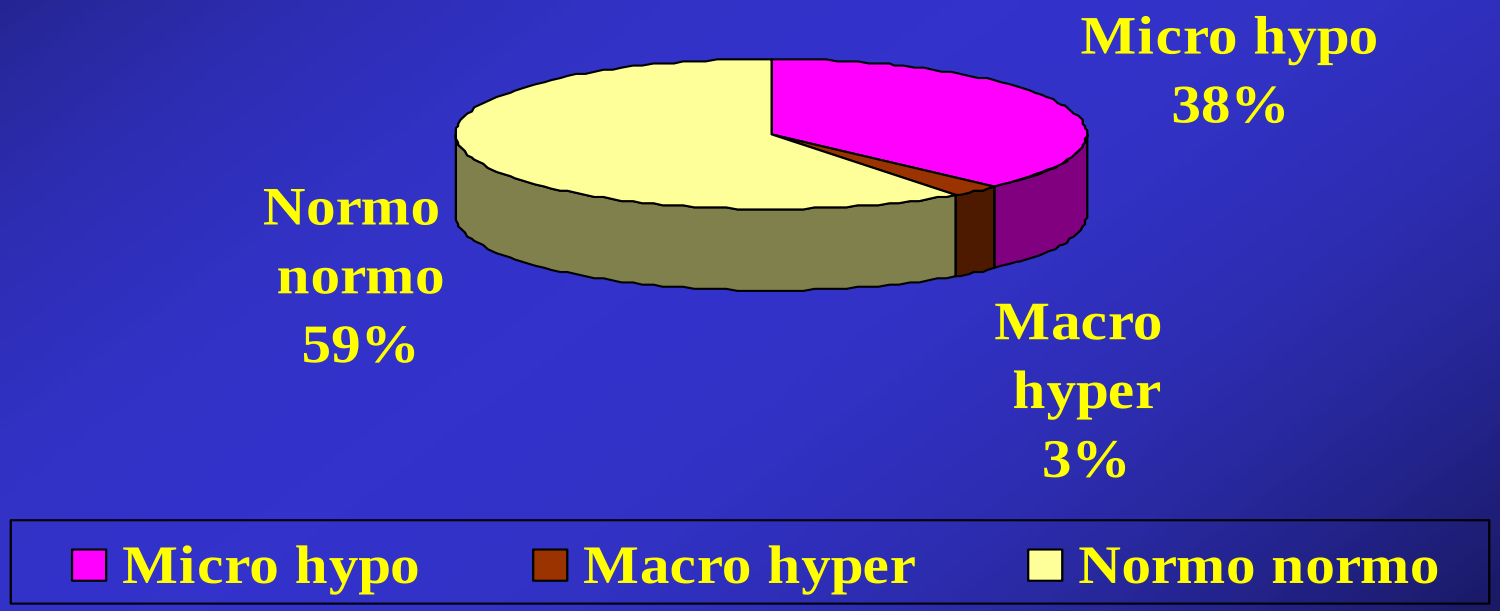
Results

Distribution of anemia in studied patients.



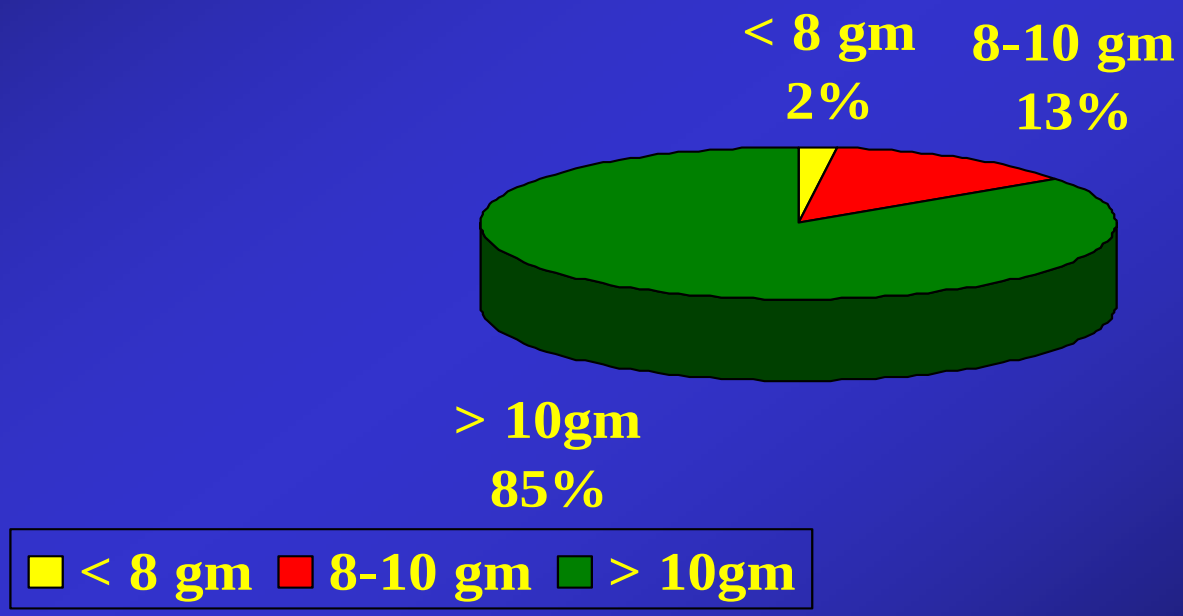
Results

Types of anemia in our patients



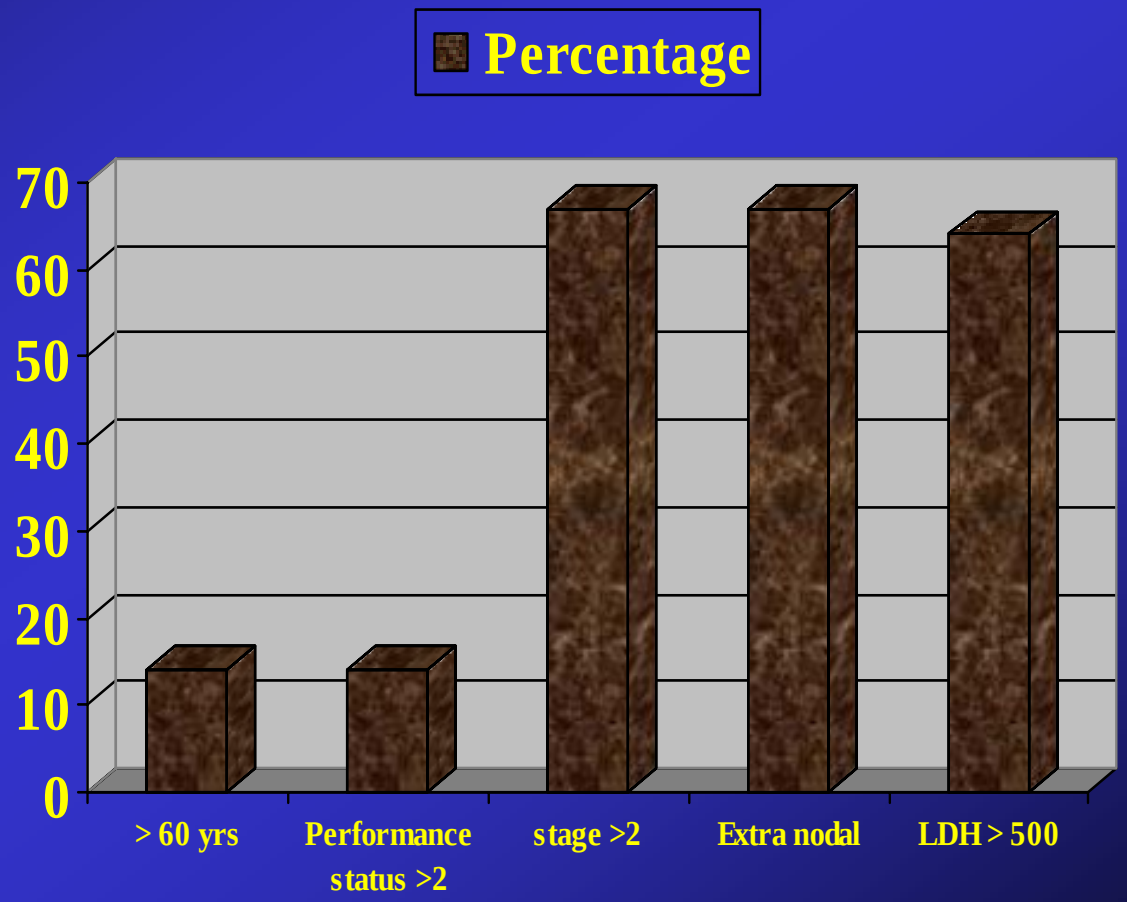
Results

Distribution of hemoglobin level in studied patients

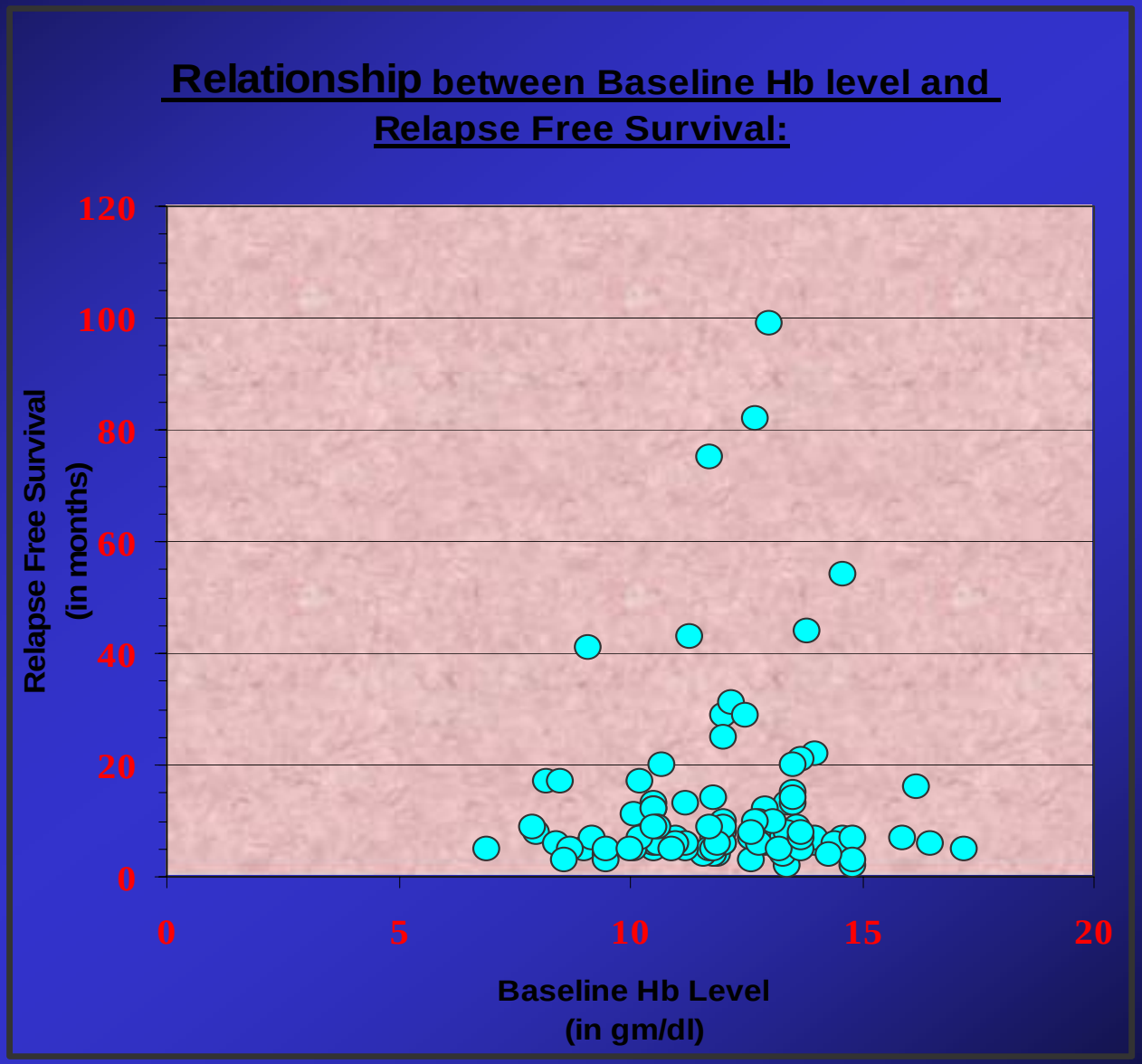


Results

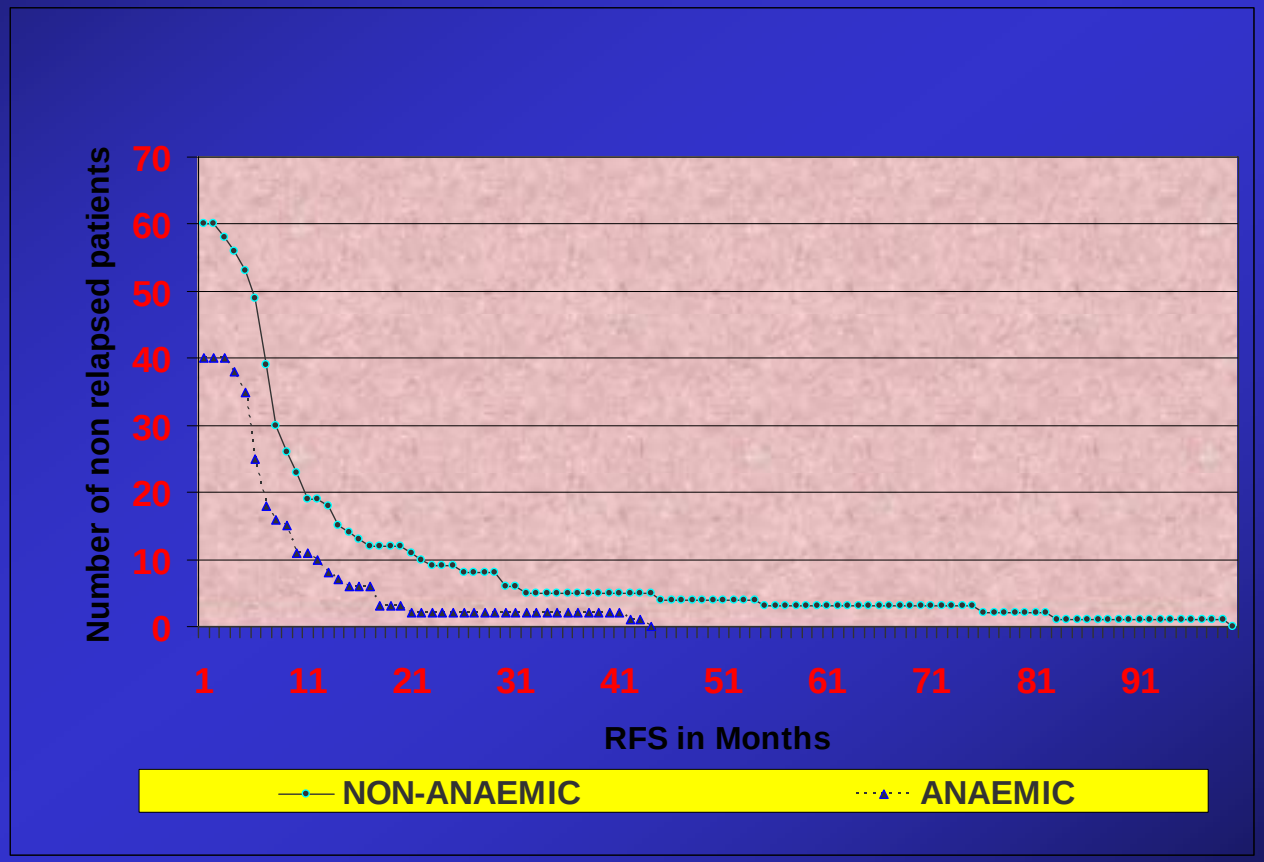
Criteria of IPI in studied patients



Results


Relationship between Baseline Hb level and Relapse Free Survival:
Relapse Free Survival (in months)
120
100
80
60
40
20
0
0
5
10
15
20
Baseline Hb Level (in gm/dl)

Results


Number of non relapsed patients
70
60
50
40
30
20
10
0
1
11
21
31
41
51
61
71
81
91
RFS in Months
NON-ANAEMIC
ANAEMIC

Conclusion&Recommendations

These results emphasize the importance of anemia as an adverse prognostic factor in NHL particularly in certain histological subgroups and addition of hemoglobin value to the five parameters of IPI improved the predictive value of this index for overall survival (OS). So, anemia has to be taken into consideration in future prognostic factor studies since hemoglobin value is easy to measure, cheap and easily reproducible.


Thank
you

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