

## The Expression and Significance of CyclinD2 and Bcl-2 in Diffuse Large B-cell Lymphoma

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**Abstract: Objective:** To study the expression and significance of cyclinD2 and Bcl-2 in diffuse large B-cell lymphoma. **Methods:** This project used immunohistochemical methods to detect the expression of cyclinD2 and Bcl-2 in 120 cases of diffuse large B-cell lymphoma and 80 cases of reactive hyperplasia of lymphoid tissue. The materials were collected from the hospital from January 2018 to 2020. In March 2015, 120 patients had lymphoma tissue removed during the month of surgery. The postoperative pathological diagnosis was DLBCL. Another 80 cases of lymphoid hyperplasia (RLH) tissues were selected as controls. **Results:** CyclinD2 and BCL-2 expression were not statistically different in patients with diffuse large B-cell lymphoma in different ages, genders, locations, tissue types, and degree of differentiation; but statistically significant in different Ann Arbor stages, immunotypes, IPI index and first treatment efficacy. **Conclusion:** This research not only has important theoretical value, but also important economic value and social significance.

**Keywords:** CyclinD2; Bcl-2; Lymphoma

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type of non-Hodgkin's lymphoma (NHL), accounting for almost one-third of all cases. The cause is unknown, and it is related to immunodeficiency and environmental factors. The most typical manifestation of clinical symptoms is painless, progressive swelling of the superficial lymph nodes. The swelling has smooth surface, hard texture, and feels like a ping pong ball or the hardness of the tip of the nose. It may cause damage to the digestive, urinary, nervous and other systems, and threaten life<sup>[1]</sup>. China is a country with a large population. Diffuse large B-cell lymphoma in China accounts for about 50% of Hodgkin's lymphoma. Rituximab combined with cyclophosphamide, doxorubicin, vincristine and prednisone (CHOP) can cure 76% of CD20-positive patients, and about 30% of diffuse large B-cell lymphomas are refractory, relapsing after sexual intercourse or chemotherapy. 1% to 2% of diffuse large B-cell lymphomas is negative for CD20 and is ineffective for rituximab treatment. These patients are often accompanied by involvement of extranodal organs, and the prognosis is poor due to chemotherapy resistance. The median survival period ranges from several months to several years, and patients are prone to early relapse. Therefore, this paper will analyze the expression and significance of cyclinD2 and Bcl-2 in diffuse large B-cell lymphoma. Now the report is as follow<sup>[2]</sup>.

Diffuse large B-cell lymphoma is the most common

# 1 Materials and Methods

## 1.1 General Materials

From January 2018 to March 2020, 120 cases of lymphoma tissue were collected in the hospital. The postoperative pathological diagnosis was DLBCL, and 80 cases of reactive lymphoid hyperplasia (RLH) tissue were selected as controls. All patients with diffuse large B-cell lymphoma received no treatment before surgery and had complete follow-up data.

## 1.2 Methods

The differences in expression of cyclinD2 and Bcl-2 in diffuse large B-cell lymphoma tissue and lymphoid tissue reactive hyperplasia were analyzed by immunohistochemistry. The relationship between cyclinD2 and Bcl-2 and clinicopathological characteristics was analyzed, and the relationship between cyclinD2 and Bcl-2 was explored. Bcl-2 is related to the occurrence and development of diffuse large B-cell lymphoma.

## 1.3 Observation Indicators

To detect the relationship between cyclinD2 and Bcl-2, and to explore the relationship between cyclinD2

and Bcl-2 in the occurrence and development of diffuse large B-cell lymphoma. The therapeutic effect of cyclinD2 and Bcl-2 on diffuse large B-cell lymphoma was observed.

## 1.4 Statistical Methods

The data of this study was statistically processed by spss.20.0 software, and the measurement data is expressed in %.

# 2 Results

## 2.1 CyclinD2, Bcl-2 Expressions

CyclinD2 and Bcl-2 have differential expression of lymphoid tissue reactive hyperplasia in diffuse large B-cell lymphoma tissue, and the difference is statistically significant, see Table 1.

## 2.2 Clinicopathological Characteristics

The expression of cyclinD2 and Bcl-2 has nothing to do with the age, sex, location, tissue type and degree of differentiation of diffuse large B-cell lymphoma; it is related to the efficacy obtained through the first treatment, IPI index and immune type. For details, see Table 2.

**Table 1.** Comparison of cyclinD2 and Bcl-2 expression between the two groups [n(%)]

Group	n	cyclinD2	Bcl-2
Diffuse large B-cell lymphoma group	87	29 (32.83)	54 (60.92)
Lymphoid tissue reactive hyperplasia group	23	1 (2.00)	3 (7.00)

**Table 2.** The expression and clinicopathological characteristics of cyclinD2 and Bcl-2 in diffuse large B-cell lymphoma

Indicator	n	cyclinD2		$\chi^2$	P	Bcl-2		$\chi^2$	P	
		Positive	Negative			Positive	Negative			
Age (y.o.)	≥40	55	18	37	0.025	0.874	36	19	0.396	0.254
	<40	34	13	21			20	14		
Gender	Male	41	15	36	0.026	0.165	36	5	0.258	0.336
	Female	47	22	25			25	14		
Site	Extranodal	52	13	16	1.078	0.369	58	9	0.246	0.259
	Intranodal	36	15	19			45	16		
Tissue Type	Immunoblast	12	4	25	0.065	0.897	25	10	0.058	0.587
	Central blast	78	25	26			26	25		
Degree of Differentiation	High	50	15	36	0.016	0.842	14	18	0.415	0.367
	Low	39	14	25			36	26		
Ann Arbor Stage	I-I	54	16	45	0.036	0.000	24	19	16.254	0.000
	I-IV	36	15	16			34	24		
Immunophenotyping	non-GCB Type	45	6	45	16.321	0.000	28	26	25.236	0.003
	GCB Type	42	24	17			45	13		
IPI Index	Low	41	7	36	10.252	0.009	46	25	10.008	0.000
	High	48	23	32			48	11		
First Treatment Efficacy	Complete Remission	52	16	47	6.232	0.035	53	28	15.258	0.012
	Incomplete Remission	36	18	38			41	6		

### 3 Discussion

Diffuse large B-cell lymphoma is a malignant tumor of the circulatory system and belongs to the category of lymphoma. Lymphoma is divided into Hodgkin's lymphoma and non-Hodgkin's lymphoma, and diffuse large B-cell lymphoma is the most common lymphatic system tumor in adults, that is, it belongs to the most common pathological type of non-Hodgkin's lymphoma. It accounts for 30%-40% of all non-Hodgkin's lymphomas. The typical clinical manifestations of diffuse large B-cell lymphoma are painless, progressive lymphadenopathy, often accompanied with fever, fatigue, and night sweats. Among them, lymphoma in 40% of patients can also originate in lymph nodes. The most common sites involved are the gastrointestinal tract, stomach or ileocecal area. It often appears in other parts too, but they are unlikely to originate in the bone marrow or directly involve the blood<sup>[3]</sup>. Diffuse large B-cell lymphoma is more common in elderly people over 60. Clinically, "rapid increase in painless mass" is a typical symptom. It can also cause varying degrees of nosebleeds and difficulty swallowing. The prognosis is usually unsatisfactory.<sup>[4]</sup> It can also be seen in some children. The patient responded better to chemotherapy. Co-administration with cyclinD2 and Bcl-2 can greatly improve the survival rate of patients.

Bcl-2 can inhibit cell death caused by various cytotoxic factors. Overexpression of Bcl-2 can enhance the observed resistance of cells to most cytotoxins<sup>[5]</sup>. Since Kerr put forward the concept of apoptosis in 1972, people have conducted extensive and in-depth research on the phenomenon of apoptosis. However, so far, the molecular and biochemical mechanisms of apoptosis have not been fully understood, and the initial understanding mainly comes from the study of the Bcl-2 gene family<sup>[6]</sup>. It is known that the process of apoptosis can be divided into three phases: induction phase, action phase and degradation phase. In the induction phase, cells receive various signals to trigger various effects. After entering the action phase, the cells enter irreversible programmed death after certain regulatory molecules decided the fate (survival/death) of cells. These regulatory molecules include a series of proto-oncogenes and their inhibitory effects on oncogenes, among which the Bcl-2 family plays a

decisive role. During the degradation phase, visible apoptosis occurs.

CyclinD2 can activate corresponding cell cycle protease and form a complex, guide RB phosphorylation inactivation, promote up-regulation of gene expression, and participate in DNA synthesis. Bcl-2 gene (ie, B-cell lymphoma/leukemia 2 gene) is an oncogene that has an inhibitory effect on cell apoptosis. In recent years, some studies have begun to reveal the mechanism of this effect. The Bcl-2 protein family discovered so far can be divided into two categories according to their functions. The first type is Bcl-2, which can inhibit cell apoptosis, such as mammalian Bcl-XL, Bcl-W, Mcl-1, A1, nematode Ced-9, and vaccinia virus E1B119kD, etc., while the other type has the ability to promote cell apoptosis, such as Bax, Bcl-Xs, Bad, Bak, Bik/Nbk, Bid and Harakiri. Initially, Bcl-2 was found to inhibit cell death in blood lymphocytes, and this effect was also found in other cells. However, recent studies have found that in addition to these, there are Bcl-2 insensitive apoptosis pathways. The combination of the two categories can effectively alleviate and treat diffuse large B-cell lymphoma.

Through the research above, the theoretical basis and technical support are provided for the discovery of new treatment targets for diffuse large B-cell lymphoma. The research not only has important theoretical value, but also important economic value and social significance.

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