

CHRONIC MYELOID LEUKEMIA CORRELATION WITH OTOLOGICAL DISORDER.*Daniel¹, Roberto¹¹ Oncology Department, Hospital San Jose Tec De Monterrey, Monterrey, Mexico

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ABSTRACT: The study was design to determine the symptoms of otological diseases among patients with Chronic Myeloid Leukemia. A clinical diagnostic examination was applied to find out the otological symptoms and there correlation with the CML. Pure tone audiometry and tympanometry in CML subjects and matched control subjects were also performed. There were 30 subjects constituting 17(50.6%) males and 13(43.3%) females. History of hearing loss was given by 18(60.0%) of the CML subjects by audiometry test with a higher prevalence of hearing impairment in CML cases. otological disorder classified according to phase of the CML, which was worse in the accelerate phase of CML. Hearing loss was found to be prevalent in CML despite lower prevalence of control.

KEYWORDS: Chronic myeloid leukemia; Hearing loss

INTRODUCTION:

Chronic myelogenous leukemia (CML), also known as chronic granulocytic leukemia, is a cancer of the white blood cells. It is a form of leukemia characterized by the increased and unregulated growth of predominantly myeloid cells in the bone marrow and the accumulation of these cells in the blood. CML is a clonal bone marrow stem cell disorder in which a proliferation of mature granulocytes and their precursors is found¹. Non-specific symptoms of tiredness, fatigue, and weight loss may occur long after the onset of the disease. CML is classified into 3 groups that help predict outlook. Chronic phase, Patients in this phase typically have less than 10% blasts in their blood or bone marrow samples with mild symptoms and usually respond to standard treatments. Most patients are diagnosed in the chronic phase while in accelerated phase the bone marrow or blood samples have more than 10% blasts and high blood basophil count. Last is the blast phase (blast crisis) in which bone marrow and blood samples have more than 20% blasts. The blast cells often spread to tissues and organs beyond the bone marrow.

Otological manifestations have been reported in 15-35% of leukemia patients.^{2, 3} These include moderate to severe hearing loss, tinnitus, vertigo and facial nerve palsy. The objective of this study is to determine the adverse effect of CML on ontological behavior.

PATIENTS AND METHODS:

This was study conducted at the Oncology Department, Hospital San Jose Tec De Monterrey, Monterrey, Mexico from May 2015 and August 2015. The study was conducted in accordance with the ethical standards by Declaration of Helsinki after obtaining ethical Using standard protocol⁶. The degree of hearing loss for each subject was based on the World Health Organization (WHO) standard classification⁶. The variables analyzed were age, sex, duration of illness, ontological symptoms and examination findings. Results were analyze and tabulated in the tables. Statistical analysis was plotted by Kaplan-Meier method and differences between curves were analyzed by the log-rank test. This analysis was performed in STATA version 11.1. Statistical significance p-value is ≤ 0.05 .

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RESULTS:

There were 17(50.6%) males and 13(43.3%) females included in study. The findings at ear test are summarized in (Table 1) , shows that the complications were more predominant in CML cases other than the normal control populations. Among the CML subjects the pure tone average in the right and left ears were 43.8 ± 20.1 dB HL and 41.7 ± 21.0 dB HL respectively whereas in the control subjects the values were 25.7 ± 3.4 dB HL and 17.4 ± 6.2 dB HL. Air-bone gap was recorded in any of the subjects were no significant and tympanometry was type A in all the CML and control cases. Eighteen (60.0%) CML subjects showed varying degree of hearing loss whereas 3(30.0%) of the control subjects demonstrated hearing loss (Table 2). Table 3 shows that the auditory loss was classified according to the phase of the CML. It shows that the mild condition was mostly shown in the chronic phase while the severe and worse condition had the accelerated and blast crisis. More patient data can be added to study for significant result. 100% worse condition was seen in accelerated phase and blast crisis with bilateral auditory loss in hearing.

Table 1: Ear disorder analysis percentage

	CML Subjects (n=30)				Control (n=10)			
	R	L	Both	Total	R	L	Both	Total
Mild	2	3	6	11	0	1	1	2
Moderate	1	0	0	1	0	1	0	1
Severe	2	1	0	3	0	0	0	0
Worse	0	1	2	3	0	0	0	0
Total	5	5	8	18	0	2	1	3
%	16	16	26	60		20	10	30

R=Right; L=Left; Both.

Table2: Loss in auditory among CML subjects and control subjects.

	CML Subjects(n=30)		Controls (n=10)		P-value
	N	(%)	N	(%)	
Pinna/EAC swellings	3	10	0	0	0.51
Cerumen Auris	8	26.6	3	30	0.43
Otorrhea	1	3.3	0	0	0.5
Thick Red TM (Evidence of leukemic infiltration)*	6	20	0	0	0.02
Dull TM	2	6.6	1	10	0.48
Facial-Nerve Palsy	0	0	0	0	000

Table3: Loss in auditory with CML subjects with their phase

	CMLSubjects N=46					
	R	phase	L	phase	Bil	phase
Mild	7	CP-7(100%) AP-0 BC-0	5	CP-5(100%) AP-0 BC-0	6	CP-6(100%) AP-0 BC-0
Moderate	3	CP-3(100%) AP-0 BC-0	0	CP-0 AP-0 BC-0	0	CP-0 AP-0 BC-0
Severe	2	CP-1(50%) AP-1(50%) BC-0	1	CP-0 AP-1(100%) BC-0	0	CP-0 AP-0 BC-0
Worse	0	CP-0 AP-0 BC-0	1	CP-0 AP-0 BC-1(100%)	3	CP-0 AP-2(75%) BC-1(25%)
Total	12		7		9	

Chronic phase:CP, Accelerated Phase:AP, Blast Crisis: BC, R:Right, L:Left, Bil:Bilateral.

DISCUSSION:

This study showed higher prevalence of hearing loss of 18(60.0%) in CML cases. In the control group, only 3(30.0%) had hearing impairment and all were moderate. The prevalence obtained is higher than what was reported locally by Joseph and Durosinmi⁵ and Druss². Comparable higher prevalence of hearing loss was reported by Shanbrom⁴, Joseph⁷ and included all forms of leukemia. In addition, all were sensorineural hearing loss. Hearing loss in CML is described as being sensorineural, unilateral or bilateral. It may also start as unilateral and progressing to become bilateral. It can be a presenting complaint or develop during the course of the disease. The otological manifestations may be worsened by the routine practice of steroid administration in cases of Sudden Sensorineural Hearing Loss (SSNHL) because this causes leukemoid reaction which worsens CML. Accelerated phase and blast crisis was common in the cases which shows worse auditory losses, which also have been reported in acute myelogenous leukemia and blast phase of CML by Sakshi kapur¹¹. Swelling on the pinna and EAC was found in 2(10%) of the subjects. Similar swellings have been reported to be granulocytic

sarcoma in the literature and one could conclude that this was likely the case in this study⁸. 6 (20%) of the CML subjects showed the characteristic which red thick tympanic membrane. This finding however did not have any effect on the findings at tympanometry as the subjects had the normal Type A Tympanogram and we did not find any subject with conductive hearing loss. The red thick tympanic membrane noted in leukemia has been linked to possible to leukemic infiltration of the middle ear extending to the TM^{9,10}. It is possible that the occurrence of thick red TM may be sign of otological affectation in progress and significance needs further evaluation.

CONCLUSION:

Hearing loss is more common in patients with CML than generally reported since patients may not report mild to moderate hearing loss. Since patient with CML may present with severe to profound Sudden Sensorineural Hearing Loss and tinnitus, it is important that Otorhinolaryngologist perform routine white blood cells count in patients with Sudden Sensorineural Hearing Loss before commencing steroid administration. We also recommend that patients with CML should have regular otological assessment.

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