

## Specific Prevalence of Tumor-like Bone Lesions in Children

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### **Abstract**

Analyses of the 1981-2000 data for the prevalence of childhood tumor-like bone lesions in Georgia in relation to the age and sex of the patients revealed that the most frequent forms of pathology were bone cyst, fibrous displasia, and non-osteogenic fibroma, with the ratio of 6:2:1. These pathologies were found in boys twice as often as in girls. Patients with bone cyst were, as a rule, younger than those with fibrous displasia and non-osteogenic fibroma. All mentioned above reflects the specificity of tumor-like bone lesion prevalence in children in Georgia.

**Key words:** *tumor-like bone lesion, age, sex*

### **Introduction**

**T**umor-like lesions of bones often develop in children (F. Schajowicz, 1994; Y.N. Solovyov, 1998), causing their disablement (M.V. Volkov, 1985; P.A. Ravell, 1993, V.V. Nakechalov, 2000). Today the priority is given to tumor epidemiology trials, thus we found it topical to collect data on tumor-like bone lesion prevalence in children in our country. As there were no such data for Georgia, we think that the results of epidemiological study of tumor-like lesions of bones in children could have positive effect on organization of specialized medical service and would help to define the optimal number of hospital beds.

### **Methods**

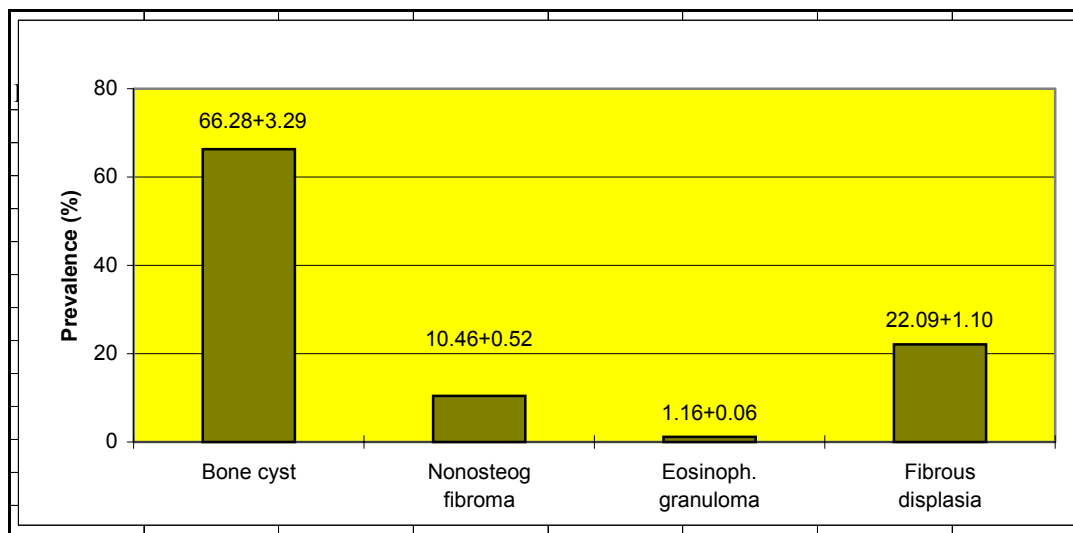
To study prevalence rate of tumor-like lesion of bones in children, data for 1981-2000 were analyzed. During this period 172 surgical interventions were performed in children; based on the results of pathohistologic examinations of operative materials, different tumor-like lesions of bones were diagnosed. Besides, attention was paid to patients' age and sex. To study age-specific

prevalence of tumor-like lesions of bones patients were divided into 5 groups: Gr.1-0 to 3 yrs; Gr.2- 4 to 6 yrs; Gr.3 - 7 to 9 yrs; Gr.4-10 to 12 yrs.; Gr.5-13 to 15 yrs. Numeric data were analyzed using methods of biologic statistics; statistical determinants, Student's (t) criteria, and conformity criteria ( $X^2$ ) were determined under the conditions of alternative variations. The 95% - evidence interval ( $P<0.05$ ) was adopted as statistically evident.

### **Results**

Results of pathohistologic examinations of operative materials obtained from children who underwent surgical interventions due to tumor-like bone lesions in 1981-2000 indicate, that in the 99.9% - evidence range, bone cyst was the most frequently registered lesion; fibrous dysplasia of bone occupied the second position, while eosinophilic granuloma was the rarest form registered in the 99.9% -evidence range. (See *Fig. 1*).

Data achieved indicate that mean age of the patients at the moment of surgical intervention due to tumor-like bone lesions was  $9.89\pm 0.25$  yrs. Patients with tumor-like lesions of bones were not equally distributed among the age-groups. (See *Tab. 1*).



**Fig.1** Prevalence of tumor-like lesions of bones in children.

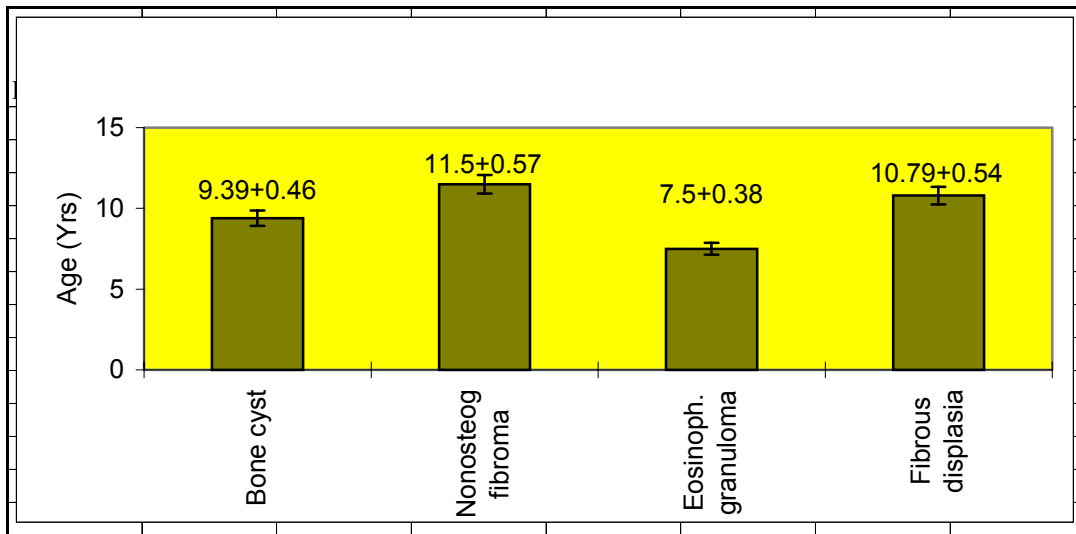
		<b>Age Groups</b>				
<b>Lesion</b>		<b>I (0-3yrs)</b>	<b>II (4-6yrs)</b>	<b>III (7-9yrs)</b>	<b>IV (10-12yrs)</b>	<b>V (13-15yrs)</b>
Number	Bone Cyst	3	18	40	33	20
	Non-osteogenic Fibroma	1	1	2	5	9
	Eosinophilic Granuloma	0	1	0	1	0
	Fibrous Displasia	2	2	7	11	16
Total rate (%)		3.49±1.40	12.79±2.55	28.49±3.44	29.07±3.46	26.16±3.35

**Tab.1** Age dependent specific prevalence of tumor-like bone lesions in children.

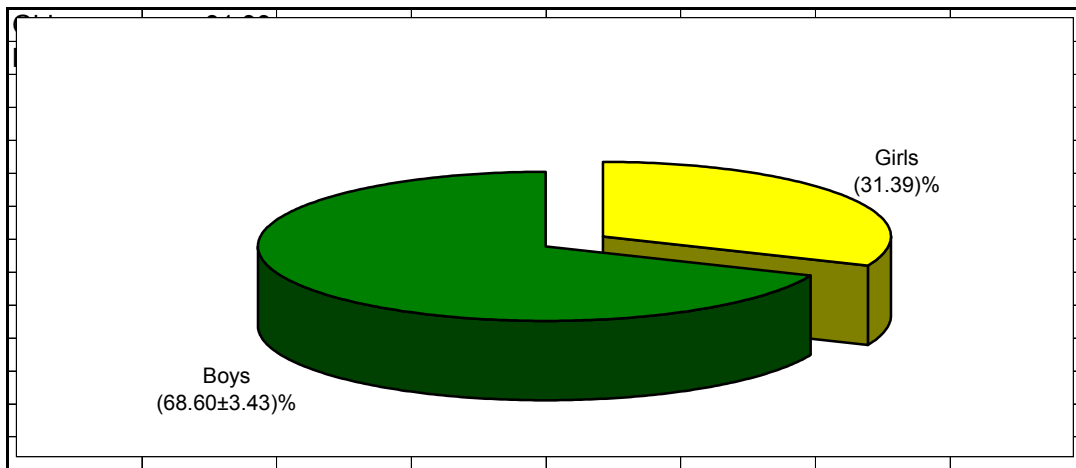
In the 99.9% - evidence range mentioned above pathologies were observed the most frequent at the age of 7-15 yrs (in the 95% - evidence range, there was no difference between the groups of this age interval); age-group of 4-6 yrs occupied the second position, while in children aged 3 yrs tumor-like lesions of bones were registered the least frequent.

Analyses of age-specific prevalence of tumor-like lesions revealed that studied pathologies were specific for mean age of the patients (see Fig.2)

Different tumor-like bone lesions had various frequencies in boys and girls (see Tab.2)



**Fig.2** Mean age of children with various tumor-like lesions of bones.



**Fig.3** Sex dependent distribution of tumor-like bone lesions in children.

Sex	Number of Tumor-like Lesions of Bones			
	<i>Bone Cyst</i>	<i>Non-osteogenic Fibroma</i>	<i>Eosinophilic Granuloma</i>	<i>Fibrous Displasia</i>
Girls	31	9	1	13
Boys	83	9	1	25

**Tab.2** Sex dependent specific prevalence of tumor-like bone lesions in children.

In total, tumor-like bone lesions were diagnosed mostly in boys (119 out of 172, *Fig.3*); boys to girls ratio in bone cyst was 2.5:1 ( $X^2=0.88$ ); approximately the same ratio was observed for fibrous dysplasia - 2:1 ( $X^2=0.013$ ); and non-osteogenic fibrosis and eosinophilic granuloma were equally frequent for both sexes.

### **Discussion**

Results of the study revealed that bone cyst, fibrous dysplasia, and non-osteogenic fibroma were the most frequent forms of tumor-like bone lesions in children in our country, with the ratio of 6:2:1 ( $X^2=0.05$ ). Eosinophilic granuloma was quite rare, while other pathologies, included in this group, were not registered during the 20 years of the study period. Correlation between boys and girls having these lesions was 2:1 ( $X^2=2.28$ )

All mentioned above reflects specificity of tumor-like bone lesion prevalence in childhood age.

Data obtained indicate that bone cyst developed at an earlier age, than fibrous dysplasia and non-osteogenic fibroma in the 95% - evidence range ( $t=2.27$ ) and 98% - evidence range ( $t=2.44$ ), respectively; while the age of children with fibrous dysplasia and non-osteogenic fibroma did not differ in the 95% - evidence range.

Eosinophilic granuloma was registered only in two cases (patients aged 4 and 11 yrs); thus, these data were too small to determine the age at which the lesion developed most often.

In patients aged 7 yrs and over surgical interventions were performed 24-times more often, than in patients aged 0-3 yrs. As patients were hospitalized, when complications (pathologic fractures) were already present, we may suggest, that in such cases the disease had developed long before admission to the hospital. The reasons are late diagnosis of tumor-like bone lesions, from one hand, and the fact that parents did not agree to timely surgical intervention due to definite reasons (mostly, financial problems, and fear), from the other hand.

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## **Особенности распределения по полу и возрасту детских опухолеподобных поражений костей**

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### **РЕЗЮМЕ**

Изучение особенностей распределения по полу и возрасту детских опухолеподобных поражений костей показало, что в Грузии 1981 по 2000 годы, в основном зарегистрированы костная киста, фиброзная дисплазия и неостеогенная фиброма (в соотношении 6:2:1). У мальчиков указанные заболевания отмечаются в два раза чаще, чем у девочек. Костной кистой обычно болеют дети сравнительно меньшего возраста в сравнении с детьми болеющими фиброзной дисплазией и неостеогенной фибромой, что отражает особенности распределения детских опухолеподобных поражений костей в Грузии.

**Ключевые слова:** *опухолеподобные поражения костей, возраст, пол*