

# Bone health and metabolic syndrome in childhood cancer survivors

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## OBJECTIVES

Metabolic syndrome and impaired bone health are common complications in childhood cancer survivors, and both are possibly related with decreased physical activities.

We aimed to evaluate the prevalence rates of metabolic syndrome and osteopenia in adolescent/young adult childhood cancer survivors. We also aimed to investigate the relationship between physical activity and these complications.

## METHODS

Subjects were 88 childhood cancer survivors aged 15 to 25.7 years. Controls were 159 healthy participants of 2011 Korean National Health and Nutrition Examination Survey (KNHANES). Demographic and medical characteristics were obtained from the patients' medical records. Metabolic syndrome was defined by NCEP criteria, and was evaluated by physical examination and laboratory test. Physical activities were evaluated using questions from KNHANES.

## RESULTS

	All patients (N=88)	Questionnaire responders (N=40)		Control (N=109)
		Walking* (N=28)	No walking (N=12)	
Obesity	14 (15.9)	2(7.1)	1(8.3)	25(22.9)
Impaired fasting glucose	1 (1.1)	0(0)	1(8.3)	1(0.9)
Hypertriglyceridemia	20(22.8)	6(21.4)	1(8.3)	14(12.8)
Low HDL	13(14.8)	3(10.7)	3(25.0)	12(11)
High blood pressure	10(11.4)	3(10.7)	1(8.3)	9(8.3)
Have 1 or more components	34(38.6)	10(35.7)	4(33.3)	40(36.7)

\* Walking ≥ 30 min a day, ≥ 5 days per week

Table 1. Prevalence of metabolic syndrome in childhood cancer survivors

	All patients (N=85)	Questionnaire responders (N=40)	
		Walking* (N=27)	No walking (N=12)
BMDLS z score (mean±SD)	-0.50±1.39	-0.41±1.14	-0.76±0.94
BMDLS z score < -1 (N,(%))	32(37.6%)	7(25.9%)	6(50%)
BMDLS z score < -2 (N,(%))	10(11.4%)	2(7.1%)	0(0%)

Abbreviations: BMDLS, lumbar spine bone mineral density

\*Walking ≥ 30 min a day, ≥ 5 days per week

Table 2. Bone mineral density in childhood cancer survivors

Eighty-eight survivors participated in the study (45 males and 43 females). Of the 52 adult participants, 42 replied to the questionnaire about physical activity. Childhood cancer survivors had higher walking performance rate than control group, and there was no significant difference in performance rate of other kinds of activities. Thirty-four (38.6%) survivors had one or more components of metabolic syndrome, and there were no differences in the prevalence rates of components of metabolic syndrome between patients and control group. Survivors had significantly lower BMD<sub>LS</sub> than normal reference population, with BMD<sub>LS</sub> z score of -0.50 (P = 0.001). Prevalence rates of metabolic syndrome and osteopenia were not different according to walking performance.

## CONCLUSIONS

More than one-third of young childhood had one or more components of metabolic syndrome. The prevalence rates of osteopenia in childhood cancer survivors was 37.6%, which is higher than healthy reference group.

Proper screening and early interventions for these complications are required.

## References

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