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ECR 2023 / C-17994

Changes in bone mineral density in individuals with cerebral palsy

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C-17994

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Purpose

According to Scheinberg, et al. (2015) citing Bianchi ML. (2013) Cerebral Palsy (CP) is one of the most prevalent diseases within those that affect bone mass, and is often related to other pathologies such as osteoporosis. According to António, D., H., et al, (2020) citing NIH, (2002); WHO, (2003) osteoporosis is a pathology that involves others and is defined by the deterioration of bone tissue. In this way, with the alterations caused in the bone tissue and with the reduced BMD values, the bones lose...

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Methods and materials

The Gross Motor Function Classification System (GMFCS) scale was created to classify the functionality of individuals with CP. (Rosa, A.C.A. & Matos, M.R. (2017) citing Sposito et al., (2010)) Thus, the scale was summarized in five levels, namely: ? Level I – Walks without limitations; ? Level II – Walks with limitations; ? Level III – Walks with portable mobility devices (eg crutch); ? Level IV – Can use electric mobility; ? Level V – Transported with manual wheelchair. Ultrasound handling has been widely used...

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Results

The highest percentage is in the 20 to 29 age group and in the 30 to 39 age group (33.3%). Then, the percentage of participants who are between 10 and 19 years old is 16.7%. The age group from 40 to 49 years old presents a percentage of 11.1% and, finally, the group between 50 to 59 years old with 5.6%. As can be seen from Table 1 and 2, the sample consisted of 17 female participants and 19 male participants. [Table 1] [Table 2]...

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Conclusion

The clinical characteristics will affect the BMD values, that is, the worse the classification (level IV and V), taking into account the GMFCS scale, the lower the BMD values will be. No evidence was found that age, gender, practice of sport and sun exposure are related to low BMD values. However, previous studies have shown the opposite. On the other hand, the use of auxiliary equipment for movement influences BMD values. This fact may be related to the GMFCS scale, as the worse the...

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Personal information and conflict of interest

M. Viegas: Nothing to disclose L. P. V. Ribeiro: Nothing to disclose J. Pinheiro: Nothing to disclose B. Vicente: Nothing to disclose S. I. Rodrigues: Nothing to disclose A. F. C. L. Abrantes: Nothing to disclose

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Antonio, D. H., Palma, R., Silva, A. P. R., Prestes, S. C. C., Sigolo, J. R., & Freitas, T. R. O. (2020). O kinect como tratamento na osteoporose pediátrica. *Guarujá: Desenvolvimento da Criança e do Adolescente: Evidências Científicas e Considerações Teóricas-Práticas*, 3, 679-691. Chen, C. L., Ke, J. Y., Lin, K. C., Wang, C. J., Wu, C. Y., & Liu, W. Y. (2011). Anthropometric and fitness variables associated with bone mineral density and broadband ultrasound attenuation in ambulatory children with cerebral palsy. *Journal of Child Neurology*, 26(5), 552-559. Henderson,...

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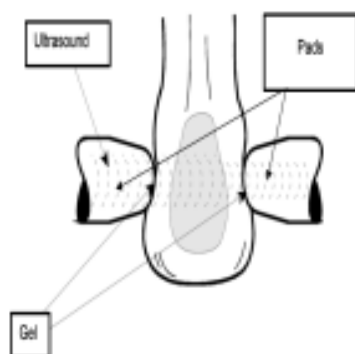


Fig 1: Ultrasound positioning

Age	N	%	% Total
10-19	6	16.7	16.7
20-29	12	33.3	50.0
30-39	12	33.3	83.3
40-49	4	11.1	94.4
50-59	2	5.6	100.0
Total	36	100.0	

Table 1: Distribution of the analyzed sample according to age group (n=36)

Sex	N	%	% Total
Female	17	47.2	47.2
Male	19	52.8	100.0
Total	36	100.0	

Table 2: Distribution of the analyzed sample according to gender (n=36)

GMFCS SCALE	N	%	% TOTAL
I	9	25.0	25.6
II	6	16.7	41.7
III	5	13.9	55.6
IV	3	8.3	63.9
V	13	36.1	100.0
TOTAL	36	100.0	

Table 3: Distribution of the analyzed sample according to the GMFCS scale (n=36)

AUX EQUIP.	N	%	% TOTAL
YES	22	61.1	61.1
NO	14	38.9	100.0
TOTAL	36	100.0	

Table 4: Distribution of the analyzed sample according to the use of auxiliary equipment...

	N	%	% TOTAL
NORMAL ($T > -1$)	9	25.0	25.0
OSTEOPENIA ($-2.5 < T < -1$)	11	30.6	55.6
OSTEOPOROSIS ($T < -2.5$)	16	44.4	100.0
TOTAL	36	100.0	

Table 5: Distribution of the analyzed sample according to the osteoporosis scale (n=36)

Table 6 BMD vs Gender (n=36)

SEX	BMD				
	N	Mean	SD	Min	Max
FEMALE	17	0.385	0.182	0.197	0.678
MALE	19	0.404	0.183	0.114	0.899
TOTAL	36	0.400	0.171	0.114	0.899

Table 6: BMD vs Gender (n=36)

Table 7: BMD vs Age group (n=36)

AGE	BMD				
	N	Mean	SD	Min	Max
10-19	6	0.423	0.151	0.197	0.678
20-29	12	0.438	0.127	0.257	0.677
30-39	12	0.412	0.216	0.114	0.899
40-49	4	0.304	0.054	0.223	0.435
50-59	2	0.215	0.025	0.197	0.233
TOTAL	36	0.400	0.171	0.114	0.899

Table 7: BMD vs Age group (n=36)

Table 8: BMD vs GMFCS (n=36)

GMFCS SCALE	BMD				
	N	Mean	SD	Min	Max
I	9	0.524	0.162	0.233	0.899
II	6	0.512	0.136	0.308	0.677
III	5	0.461	0.01	0.358	0.624
IV	3	0.332	0.01	0.271	0.433
V	13	0.254	0.07	0.114	0.409
TOTAL	36	0.400	0.171	0.114	0.899

Table 8: BMD vs GMFCS (n=36)

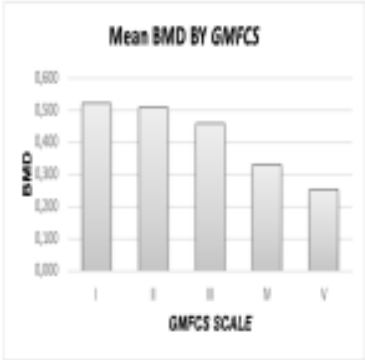


Fig 2: Mean BMD by GMFCS

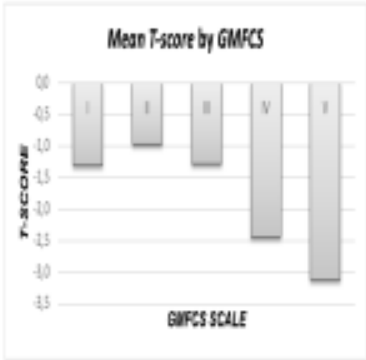


Fig 3: T-score for the GMFCS Scale