

Low Level Of Vitamin D Increases The Risk Of Low Energy Fractures In Children.

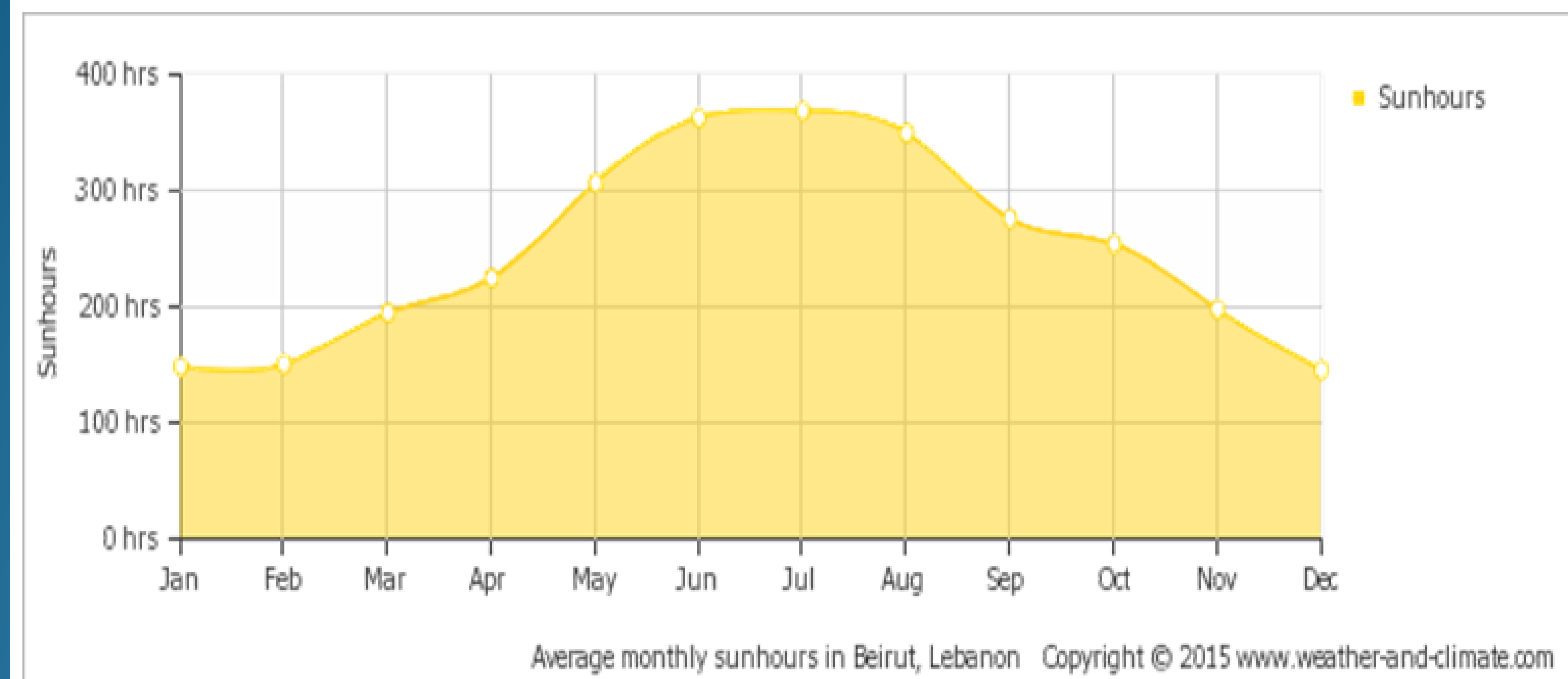
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Introduction: The physiological process by which vitamin D regulates calcium and phosphorus metabolism, the major mineral constituents of bone tissue, is by far very well understood. However, the clinical implementation of vitamin D deficiency on bone fragility in childhood remains controversial.

Results:

Sun shine hours in Lebanon



Prevalence of hypovitaminosis D by country in children in the Middle East and North Africa

Author	Year	Country - City	Latitude	N	Gender	Age (yrs) Mean±SD range	25-OHD (ng/ml)			Predictors	Comments
							Mean±SD	% < 10-12	% between 10-20		
El-Hajj Fuleihan	2001	Lebanon-Beirut	33°N	346	81 boys 88 girls	13.3 ± 1.6	Boys: 19±7 Girls: 15±8 All: 17±8	Boys: 9% Girls: 32% All: 21%	Boys: 46% Girls: 42% All: 44%	Gender Season SES Clothing	Children selected 3 schools of different SES
							83 boys 94 girls	Boys: 22±9 Girls: 19±7 All: 22±7	Boys: 9% Girls: 8% All: 4%	Boys: 25% Girls: 46% All: 36%	
Bahijri	2001	Saudi Arabia-Jeddah	21°N	935	-	4-72 months	• 4-6mon: 26.2±14.1 • 6-12mon: 24.9±14.1 • 12-24mon: 24.6±14 • 24-36mon: 6.7±11.3 • 36-72mon: 4.2±11.5	Between 5-10 ng/ml • 4-6mon: 14% • 6-12mon: 13% • 12-24mon: 14% • 24-36mon: 4% • 36-72mon: 8%	Episodes of diarrhea Dietary intake of vitamin D Sun exposure	Random selection covering all districts and all SES	
Moussavi	2005	Iran-Isfahan	32°N	318	153 boys 165 girls	14-18	Boys: 37.3±18.8 Girls: 16.8±8.4	Boys: 18% Girls: 72% All: 3.6%	< 20 ng/ml	Gender Sun exposure	Cross-sectional, multistage random selection from schools
Dahifan	2006	Iran-Tehran	35°N	414	Girls	11-15	All: 30	All: 3.6%	-	Ca intake Sun exposure	Cross-sectional, random selection from schools
El-Hajj Fuleihan	2006	Lebanon-Beirut	33°N	363	184 boys 179 girls	10-17	All: 16±9	Boys: 12% Girls: 33% All: 3.6%	Boys: 66% Girls: 51%	Gender Winter	Convenience sample, from 4 schools, balanced geographical and socioeconomic presentation
Siddiqui	2007	Saudi Arabia-Jeddah	21°N	433	Girls	12-15	-	-	-	Family income Sun exposure Intake of dairy products	Randomly selected from different schools

Objective: The aim of this case-control study is to investigate the prevalence of vitamin D deficiency among Lebanese children who experienced a “low-energy” fracture in our center.

Case children

All children aged 1-15 presented to the Emergency Department (E.D.) with **low-energy fracture**

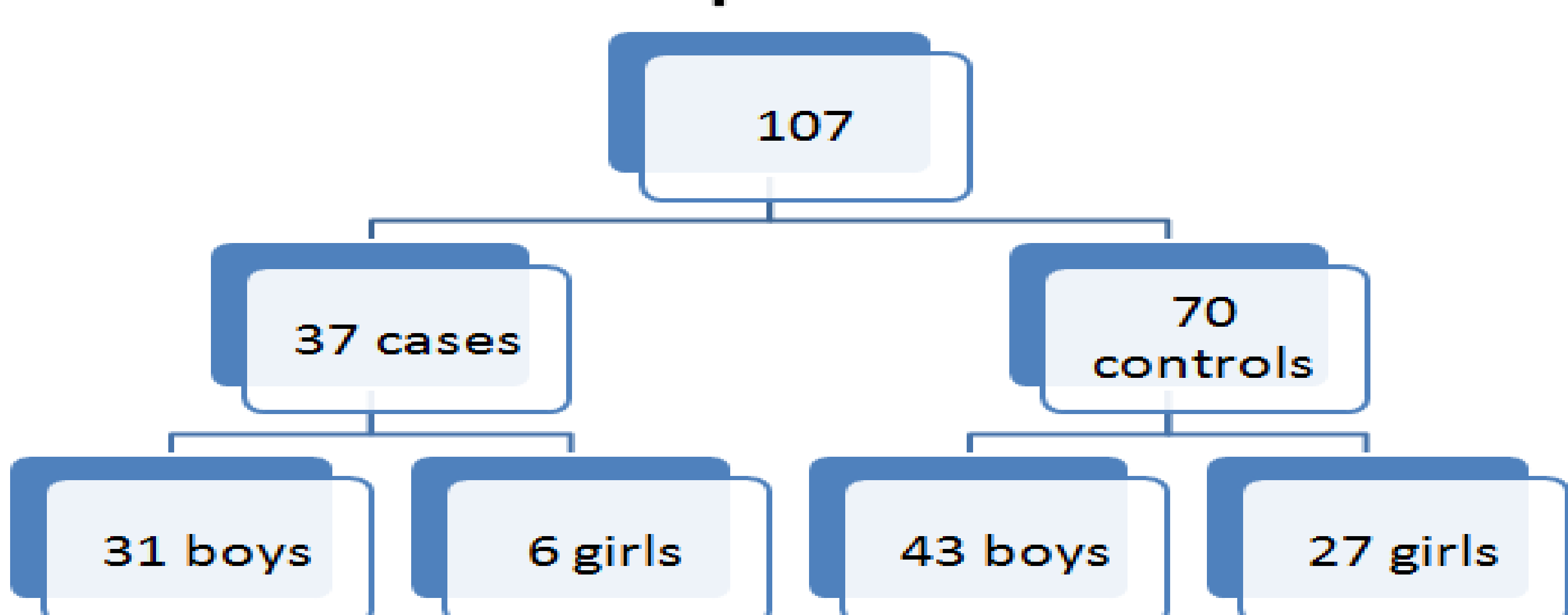
Control children

All healthy children aged 1-15 with **no history of fractures or other diseases**

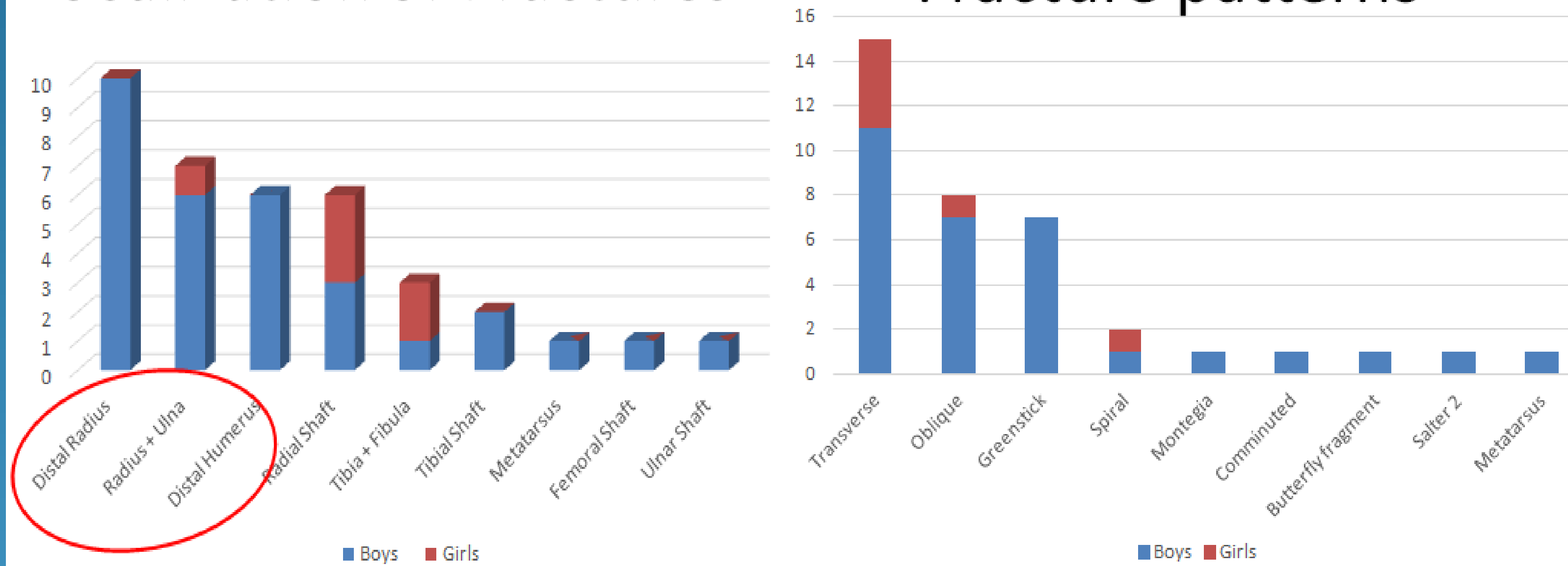
All participants had their vitamin D level measured only after submission of informed consent by the parents

Materials and Methods: A total of 37 cases and 70 control patients were included in this study. All healthy children admitted to the emergency department between 1 and 15 years of age were potential candidate for this study. Fracture was confirmed by conventional X-ray radiography and 25-HydroxyVitamin D level of the same candidates was measured.

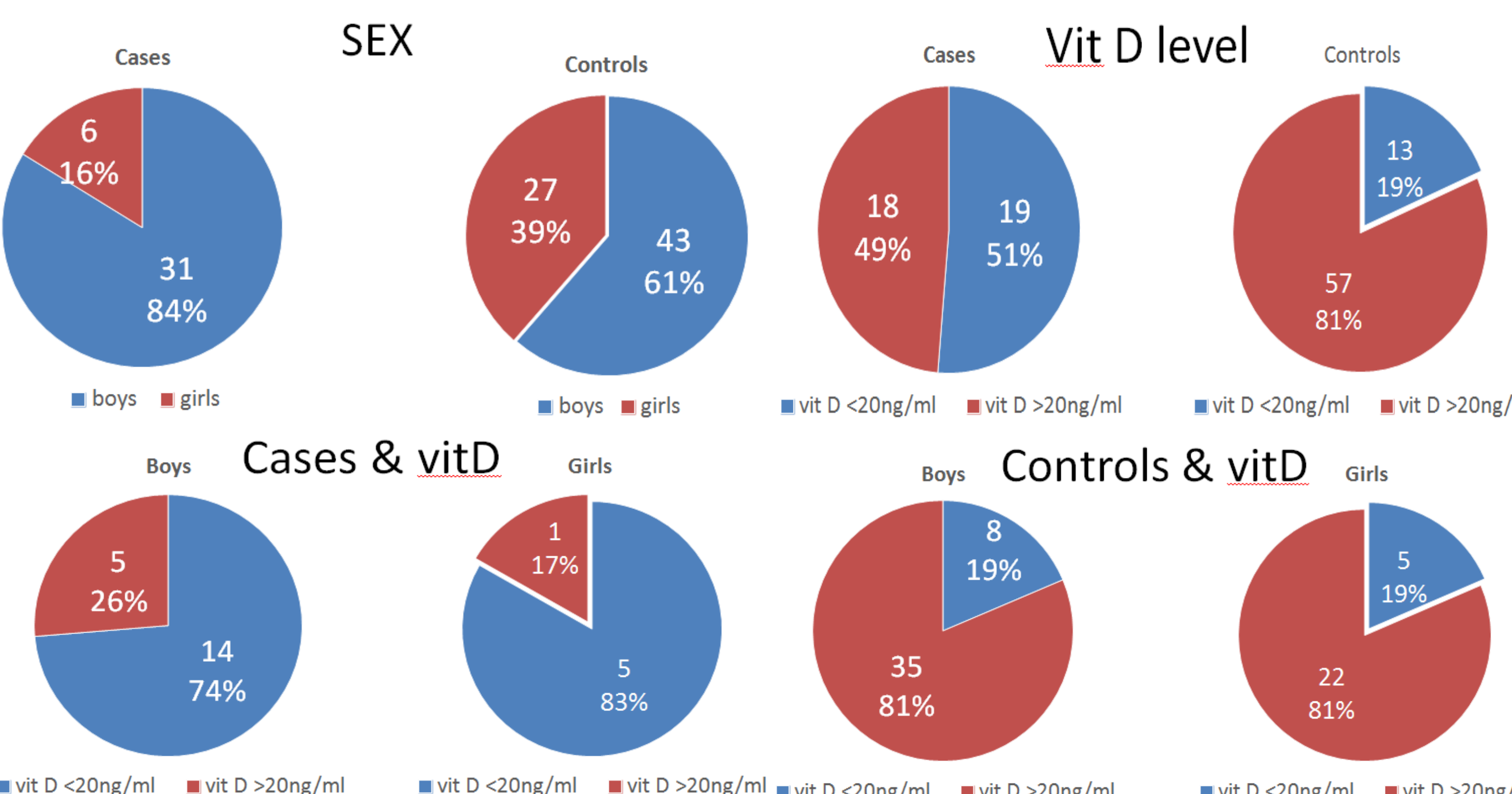
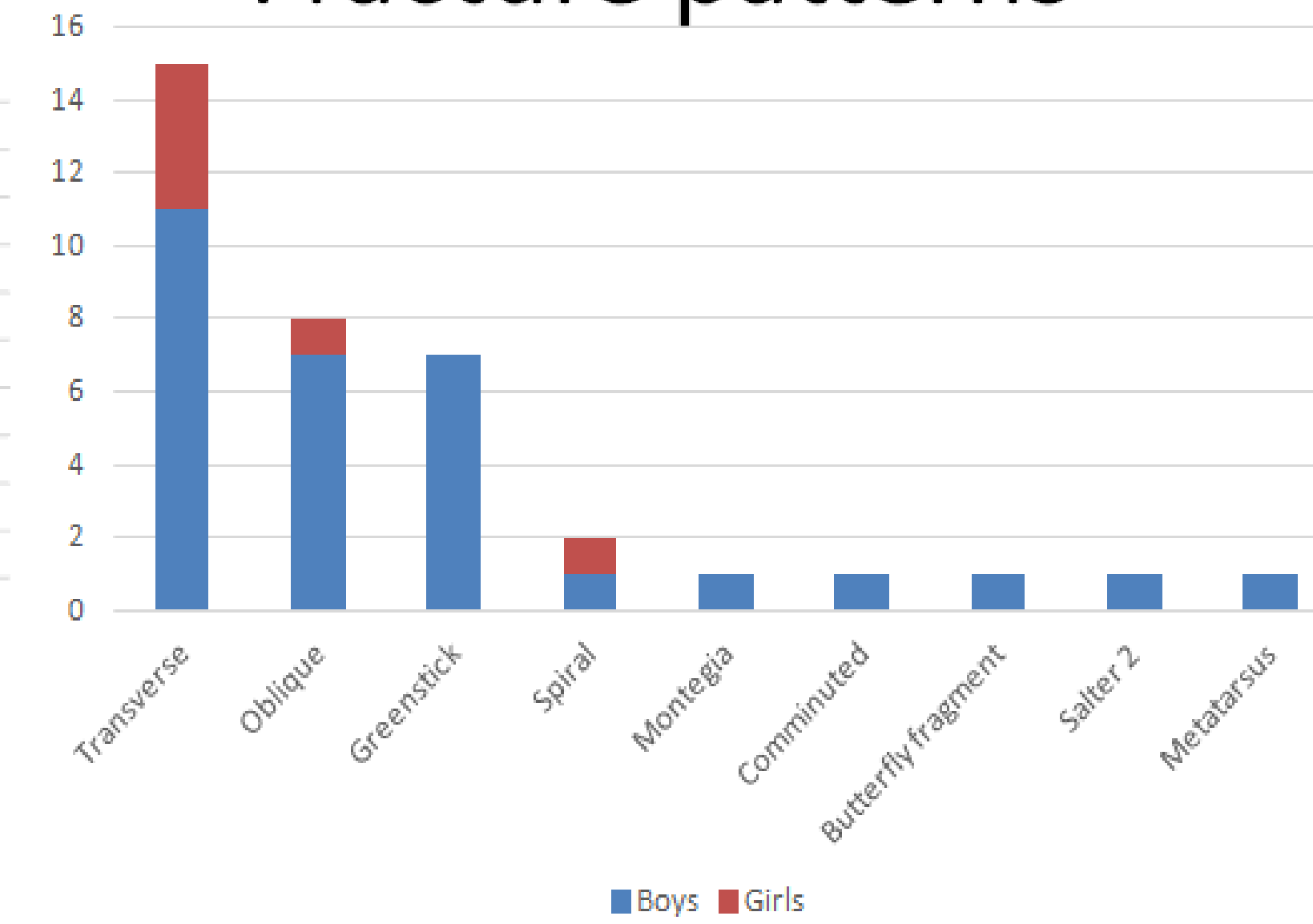
Sample size



Localization of Fractures



Fracture patterns

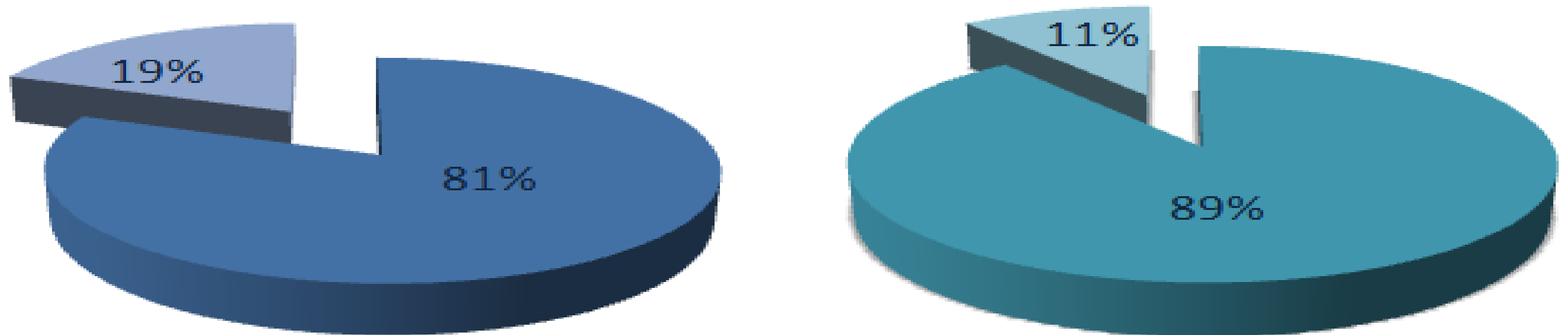


Period of occurrence of fracture

■ March to October
■ November to February

Vitamin D deficiency among case patients

■ March to October
■ November to February



Univariate analysis Vit D & low energy fracture cases & controls

Low vit D	Cases	controls	Total
Yes < 20ng/ml	19(11)	13(21)	32
No > 20ng/ml	18(26)	57(49)	79
Total	37	70	107

Chic square: 12.4076 with one degree of freedom
P-value: 0.000428 < 0.001

Conclusion:

- Association between Vitamin D deficiency and low-energy fractures
- Vitamin D deficiency during childhood: significant marker indicative of higher risks of low-energy accidental fractures?
- Further investigations & opportunities to intervene & prevent the increasing risk of pediatric bone fractures

Suggestions:

- Dosage of vit D in low energy fracture
- Dosage of siblings of fractured child
- Supplementation with vit D twice per year
- More exposure to sunlight
- Exploration of possible causes of vit D Deficiency

Limitations:

- Small sample size & monocentric study
- Operative versus non operative fracture (not studied)
- BMI of children (not studied)