

# HIP DISPLACEMENT IN CHILDREN WITH CEREBRAL PALSY

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# Introduction

- Cerebral palsy is the most common cause of physical disability .
- Hip displacement is common in children with cerebral palsy .
- The reported incidence of hip displacement in children with CP has ranged from 1% to 75% and has been correlated with the severity of involvement and the status (Lonstein JE *et al*, 1986).

# Introduction (Cont;)

- The risk of hip displacement between 2 years and 7 years of age was significantly higher for children at GMFCS level V.
- The risk of dislocation is increasing with increased gross motor disability with the highest risk among children at level five classified by the GMFCS.

# Objectives

1. To describe clinical profile of children with CP
2. To assess the gross motor function of children with CP by GMFCS level
3. To determine the proportion of hip displacement in children with CP
4. To identify the association between hip displacement and types of CP
5. To detect the association between hip displacement and GMFCS levels

# Materials and Methods

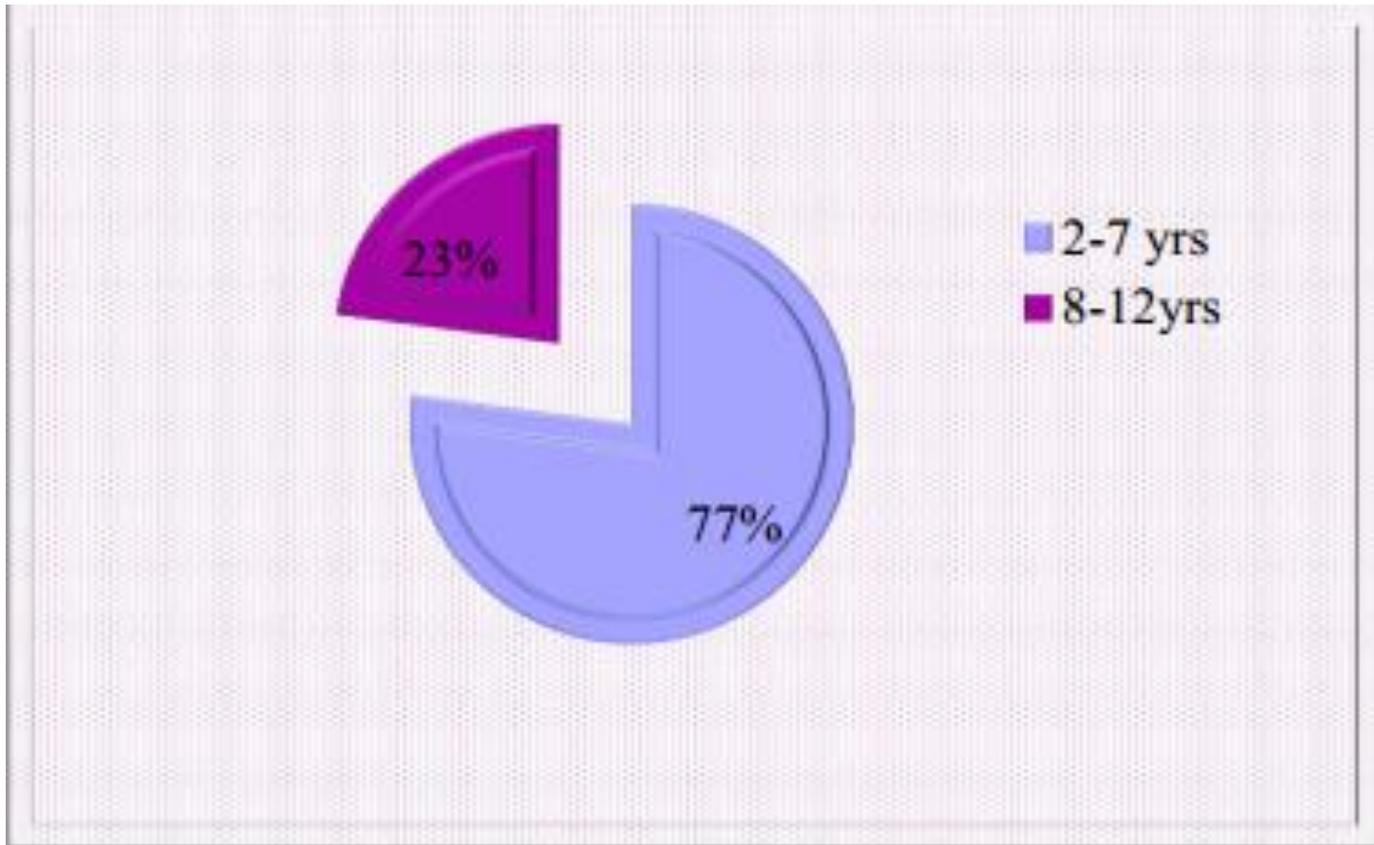
- Hospital –based, cross sectional descriptive study
- Conducted from 1st January 2015 to 31st December 2015
- 2 to 12 years of age children with cerebral palsy admitted to medical wards or attending neurology out patients' clinic of YCH
- Exclusion criteria
  - Children with CP who presenting with fixed flexion deformity of hip joint
  - Terminally ill patients

# Methods (cont;)

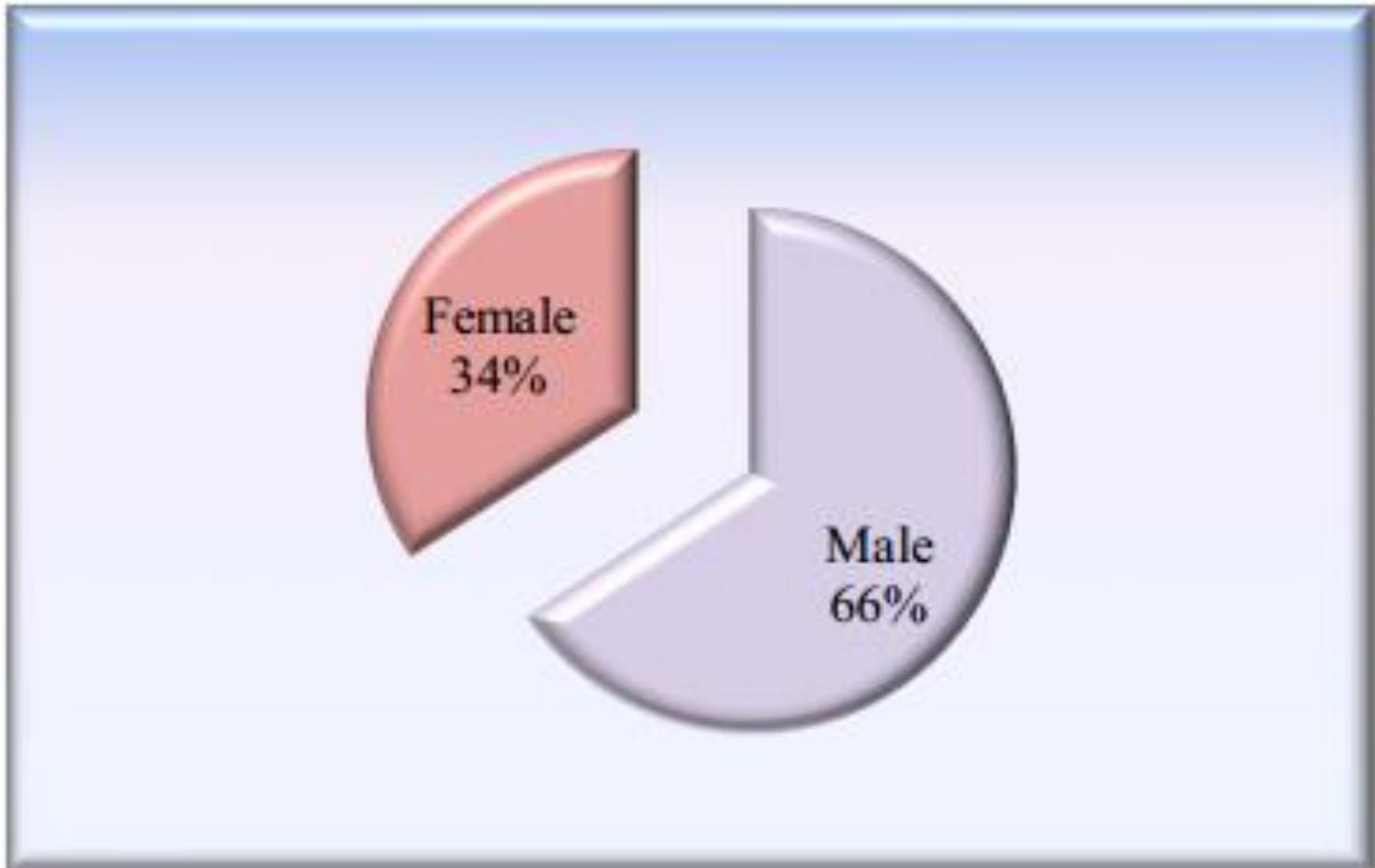
- The sociodemographic data of the study children were collected
- The gross motor functional level and types of CP were assessed
- Anteroposterior radiograph of the pelvis and hip joints were obtained with the child in the supine position using X ray machine Shimudzu (500 mA) , model 0-6/1-2P 18DE-85 with 70kV , 12mAs
- The radiographic assessments were done by senior consultant radiologist of Yangon Children Hospital.

# Results & Discussion

Age and gender distribution of children with CP

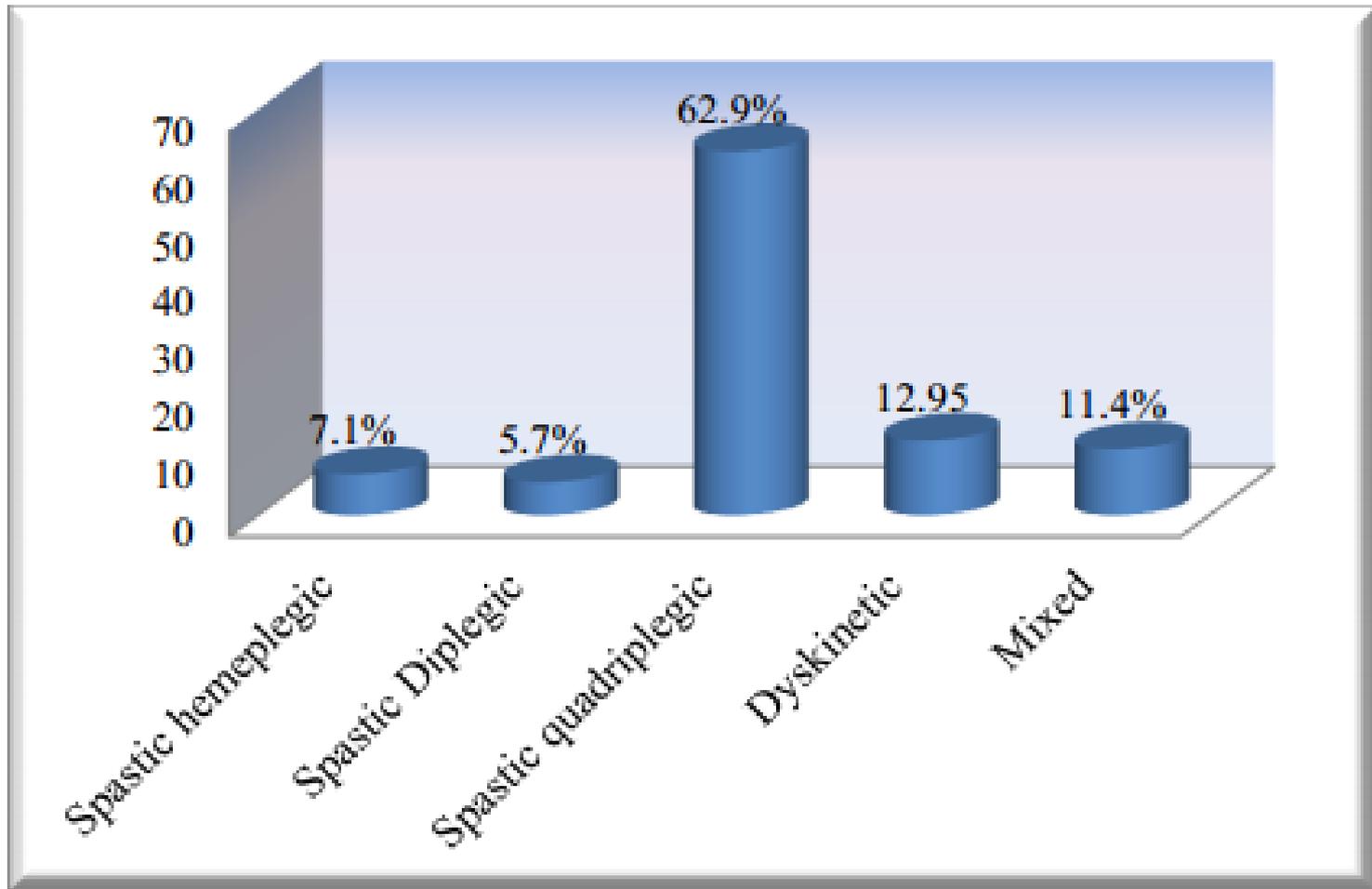


# Results & Discussion (cont;)



# Results & Discussion (cont;)

## Types of CP



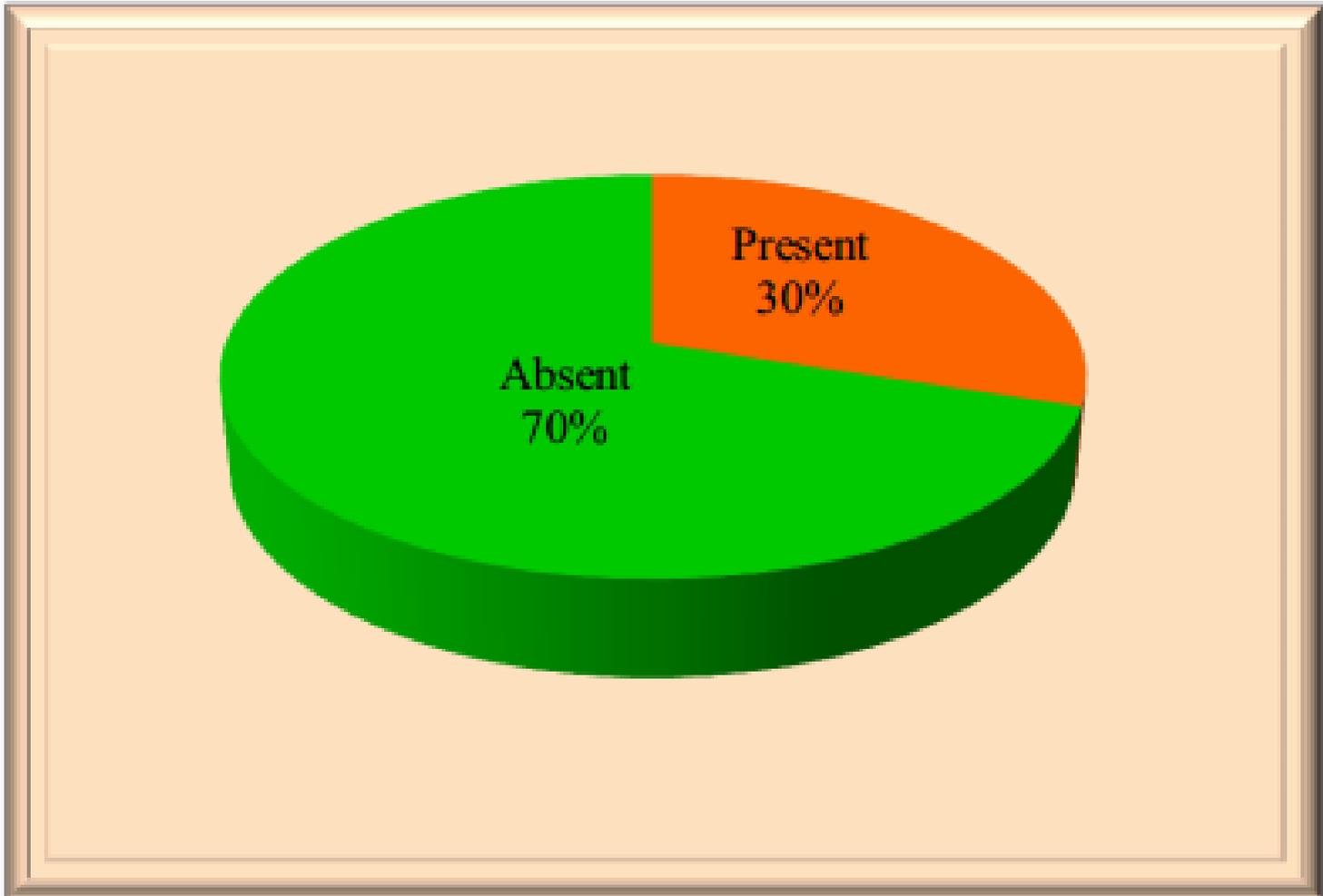
# Results & Discussion (cont;)

## GMFCS level of CP

GMFCS level	Number	Percentage
II	6	8.6
III	8	11.4
IV	2	2.9
V	54	77.1
Total	70	100.0

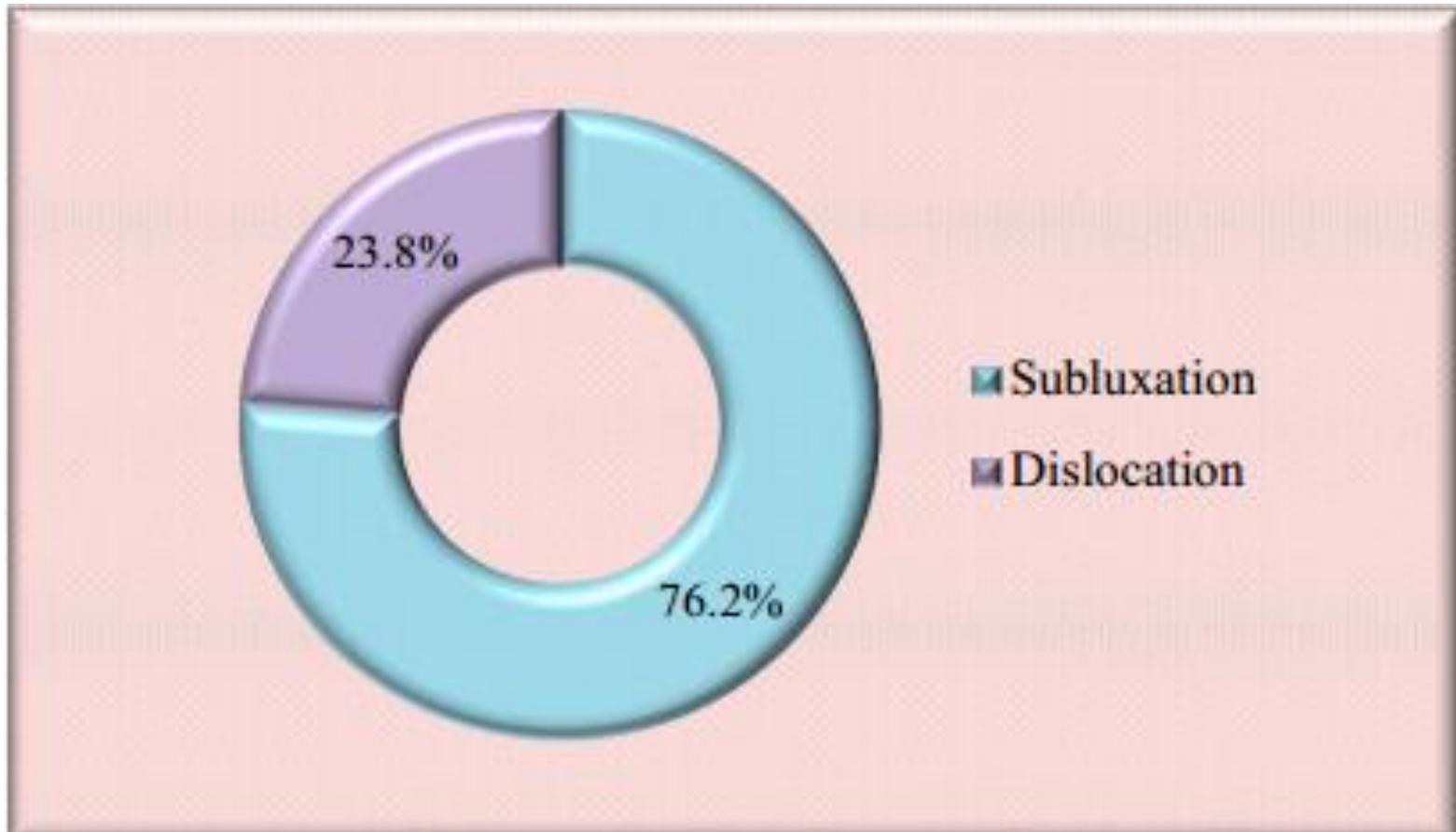
# Results & Discussion (cont;)

## Hip Displacement



# Results & Discussion (cont;)

## Types of Hip Displacement



# Results & Discussion (cont;)

Association between hip displacement and types of CP

Types of CP	Hip displacement				Test
	Present		Absent		
	Number	%	Number	%	
Spastic hemiplegic	0	0	5	100	Fisher exact 0.315
Spastic Diplegic	1	25.0	3	75.0	Fisher exact >0.999
Spastic quadriplegic	14	31.8	30	68.2	Chi <sup>2</sup> =0.1865 p-value=0.666
Dyskinetic	3	33.3	6	66.7	Fisher exact >0.999
Mixed	3	37.5	5	62.5	Fisher exact 0.900

# Results & Discussion (cont;)

## Hip Displacement and types of CP

- Therefore, children with spastic motor type are at high risk of hip displacement and should have radiographic examination as early as possible at 2 to 3 years of age which is the highest age group.

# Results & Discussion (cont;)

Association between hip displacement and GMFCS level

GMFCS level	Hip displacement				Test
	Present		Absent		
	Number	%	Number	%	
II	0	0	6	100	Fisher exact 0.213
III	1	12.5	7	87.5	Fisher exact 0.478
IV	0	0	2	100	Fisher exact 0.974
V	20	37.0	34	63.0	Fisher exact <b>0.029</b>

# Limitation of the study

- There is a few weakness in this study.
- Study design is just descriptive study and study number is small because of time limitation.
- Study place is only in tertiary centre therefore this does not represent the community or national data.

# Conclusion

- Many guidelines also recommend using GMFCS and radiographic examination for screening and surveillance programs.
- Therefore it is of the utmost importance that hip displacement in children with CP are identified with radiographic examination as early as possible.

# Conclusion (cont,)

- This study highlights not only the importance of hip displacement in children with CP but also the usefulness of GMFCS and association between hip displacement and GMFCS Level.
- Therefore , it will be helpful for development of screening program of hip displacement in cerebral palsy in the future.

# References

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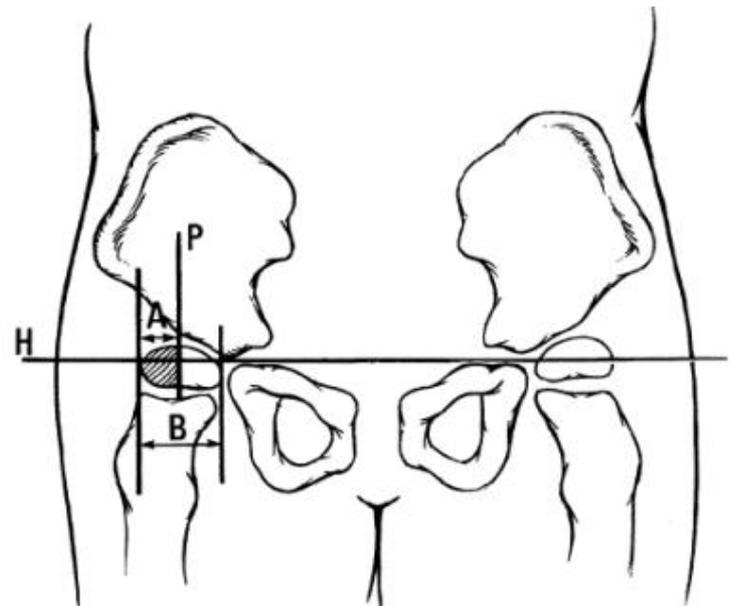
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Thank you

# Measurement of hip displacement

- Hip displacement refers to the gradual , lateral displacement of the femoral head from its socket, the acetabulum , and is measured by a migration percentage (MP). Migration percentage is calculated by dividing the width of the femoral head outside the lateral margin of the acetabulum (A) by the total width of the head of the femur(B).  $A/B \times 100$  (Mayson T, 2011)

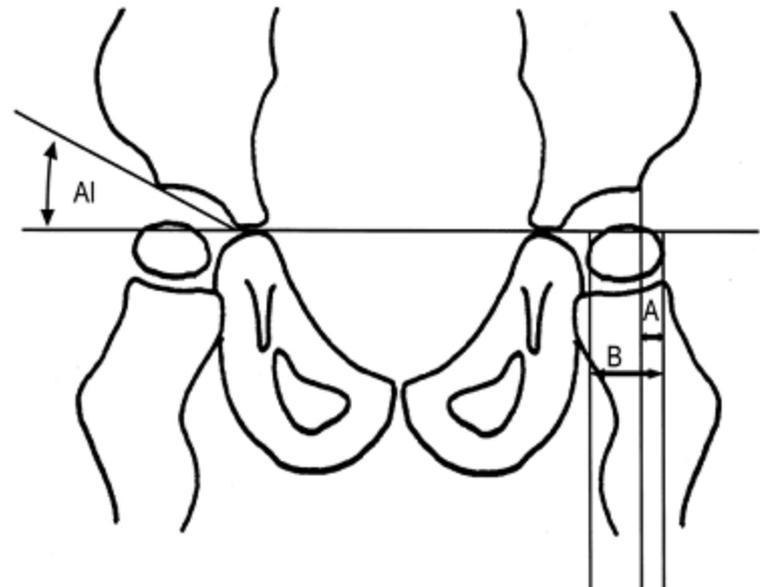


# Measurement of hip displacement(cont,)

- Hilgenreiner's line connect the innermost parts of the iliac bones. A perpendicular line was drawn to this line through the acetabular edge i.e Perkin's line.
- Depending on the migration percentage, hips will be classified as
  1. Normal (MP under 33%)
  2. Subluxation (MP 33-89%)
  3. Dislocation (MP 90% or higher)

# Measurement of hip displacement(cont,)

- The acetabular index is the slope of the acetabular roof, which is the angle between the acetabular roof and Hilgenreiner's line.
- Acetabular index of more than 30° was clearly associated with hip displacement and have a correlation between acetabular index and MP which became stronger as the child approached 48 months.
- Acetabular index should be considered as a supplement to migration percentage.



# Measurement of hip displacement(cont,)

- Pelvic obliquity is the angle between the horizontal line and the line between the lowest points of the pelvic bones on the right and left side.
- Angles less than 3° will not be taken as pelvic obliquity.
- Pelvic obliquity is unnecessary in routine screening of hips, but is a relevant measurement when associated with unilateral hip displacement and scoliosis with convexity to the opposite side. (Terjesen T,2012)

