

Growth pattern in constitutional delay of growth and puberty

**Thesis
Submitted for partial fulfillment of M.Sc. degree of
pediatrics**

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Arabic Summary

List of abbreviations

aBMD	areal bone mineral density
AI	Aromatase Inhibitors
B	Breast.
BA	Bone age.
BMI	Body mass index.
CA	Chronological age.
CDC	Center for disease control and prevention.
CDGP	Constitutional delay of growth and puberty.
CGD	Constitutional growth delay.
cm	Centimeter.
CNS	Central nervous system.
CRH	Corticotropin releasing hormone.
DAX ¹	Dosage-sensitive sex reversal adrenal hypoplasia congenita critical region on X chromosome ¹
DHEAS	Dehydroepiandrosterone acetate.
DHT	Dihydrotestosterone.
EGF	Epidermal growth factor
FSH	Follicle stimulating hormone.

FSS	Familial short stature
FGF	Fibroblast growth factor
FGFR ¹	Fibroblast growth factor receptor ¹
FGFR	Fibroblast growth factor receptors
g	Gram.
G	Genital.
GABA	Gama aminobuteric acid.
GF	Growth failure
GH	Growth hormone.
GHBP	Growth hormone binding protein.
GHD	Growth hormone deficiency.
GHRH	Growth hormone releasing hormone
GI	Gastrointestinal.
GnRH	Gonadotropin releasing hormone.
GSS	Genetic short stature
GPR ^{oε}	G-protein coupled receptor ^{oε}
HH	Hypogonadotropic hypogonadism
ICP	infancy–childhood–puberty
IGF- ¹	Insulin like growth factor- ¹ .
IGF ²	Insulin like growth factor- ² .

IGFBP- α	Insulin like growth factor binding protein- α .
IHH	Idiopathic hypogonadotropic hypogonadism
Ihh	Indian hedgehog
ISS	Idiopathic short stature.
Kg	Kilogram.
KAL λ	Kallmann syndrome gene λ
LEP	Leptin.
LH	Leutinizing hormone.
LHRH	Leutinizing hormone releasing hormone.
LEPR	Leptin receptor.
MPH	Mid-parental height
MRI	Magnetic resonance imaging.
ml	Milliliter
NRGs	Neurogulins.
NELF	Nasal embryonic luteinizing hormone releasing hormone factor
ng	Nanogram
PgE α	Prostaglandin E α .
PH	Pubic hair.
PROK α	Prokineticin α

PROKR ν	Prokineticin receptor ν
PTH	Parathyroid hormone
PTHrP	Parathyroid hormone-related protein
RDA	Recommended daily allowance.
SD	Standard deviation.
SDS	Standard deviation score.
SF ν	Steroidogenic factor ν
SFT	Skin fold thickness.
SHOX	Short stature homeobox gene
SMR	Sexual maturity rating.
T ξ	Thyroxin.
TRH	Thyrotropin releasing hormone.
TSH	Thyroid stimulating hormone.
TV	Testicular volume.
TVI	Testicular volume index
US	United states.
W.H.O	World health organization

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Introduction

Constitutional delay of growth and puberty (CDGP) represents the extreme tail of the normal distribution (*Toublanc et al.*, 1974, *Sperlich et al.*, 1974, *Du Caju et al.*, 1974 and *Han et al.*, 1974). It is more accurate though to describe it as a delay of puberty and growth as it is the delayed puberty which causes the delay in growth. Other terms which are used to describe this condition may include constitutional delay, short delay, and growth delay or even just delay (*Stanhope*, 1974).

Constitutional delay of growth and maturation (CDGP) is a term commonly used to describe youngsters with short stature and delayed onset of puberty but no evidence for systemic disease or hormonal dysfunction. Children with CDGP usually attain normal adult height, but often within the lower part of their mid-parental target height zone (*Sperlich et al.*, 1974 and *Poyrazoglu et al.*, 1974). Children with CDGP are typically underweight for height and often have a family history of CDGP, suggestive of an underlying, intrinsic problem in energy intake and energy utilization (*Solans and Lifshitz*, 1974, *Sedlmeyer and Palmert*, 1974 and *Wudy et al.*, 1974). Most children with CDGP begin to deviate from the normal growth curve before the age of 7 years, subsequently grow at a relatively normal velocity, and then have a delayed pubertal growth spurt (*Sedlmeyer and Palmert*, 1974).

Aim of work

The aim of work was to study the growth pattern of children with CDGP, with special emphasis on the height velocity and bone age at peak height velocity, and to assess the nutritional status of those children compared with other groups of normal children.

Growth

Physical stages of human life

There are no universally unanimous definitions for terms of age-related physical development stages, but the following are some approximate age ranges:

Stages of pre-natal development (fertilization – birth):

- Zygote: the point of conception, fertilization
- Blastocyst: the period between conception and embryonic stages
- Embryo: the embryonic period starts at three weeks and continues until the end of the 4th week of pregnancy
- Fetus: 4 weeks of gestational phase - birth
(*W.H.O., 2000, p. 100*).

Approximate outline of development periods in child growth (birth – puberty):

- Neonate: (newborn; 0 - 30 days)
- Infant: (baby; 1 month - 11 months)
- Toddler: (1 - 2 years) Play age: (2 - 6 years)
- Primary school age: (also called pre-pubescence; 6-12 years)
- Elementary school age: (also called middle childhood; 6-12 years)