Title: PHYSICAL GROWTH AND SEXUAL DEVELOPMENT IN BOYS: THE LARGEST CROSS-SECTIONAL STUDY

Objective: Our aim was to study parameters of physical growth and sexual development in
healthy male Caucasian boys. We also studied differences in height, weight, penile length and penile circumference of the boys from rural and urban areas.

**Design:** Population based cross-sectional

**Materials and Methods:** We examined 6200 otherwise clinically healthy Caucasian boys, aged 0 – 19 years from different parts of the Bulgaria. The towns and villages were chosen at random, representative of country’s population and structure. In each town and village the investigator chose schools, kindergartens, and childcare centers randomly and examined children at random until he reached the required number. Each of the 20 age groups (0-19) had equal numbers of children (n=310 in each group) and they were included in the respective age groups according to the completed age at the day of examination. Clinical examination of all the boys was conducted by a single investigator. It included the following somatometric parameters: height (in cm), weight (in kg), testicular volume (ml), penile length (cm), penile circumference (cm), and Tanner stage according to pubic hair distribution.

**Results:**
1. Peak period for growth of all parameters was 12-13 years depicts in parameters between 12 and 13 completed years.
2. After 17 years there was no significant growth in height and weight
3. After 18 years there was no significance growth in penile length, penile circumference, and testicular volume.
4. Penile circumference of the boys investigated from the rural regions were higher ($P=0.02$) in comparison to the boys of urban region, while height and weight were similar (Boys at one year of age, n=310). At completion of pubertal development (at age of 19 years) height and weight of boys from urban region are higher than boys from rural region ($P= 0.039; P < 0.001$). However, penile length was significantly lower in urban boys ($P= 0.006$)

**Conclusions:** Onset of puberty is characterized by activation of hypothalamic- pituitary gonadal and somatotrophic axis. Genetic as well as environmental factors play crucial role for ethnic and regional differences in pubertal development. Various studies in last decade showed change in pubertal timings especially for girls. Longitudinal studies showed 4-5 years of variation in age of onset of puberty among boys due to strong genetic components. Longitudinal studies are needed to specify the trends in male sexual development, and to identify differences in development of boys from rural and urban areas.

**Support:** None

**Author:** Analia Tamova, M.D., Ph.D.

**Department/Institution:** Endocrinology and Gerontology, Medical University

**Address:** University Clinical Center

**City/State/Zip/Country:** Sofia, Bulgaria

**Phone:** 1-216-444-9485  **Cell Phone:** 216-445-6049  **E-mail:** agarwaa@ccf.org

**Yes**
- Neither I nor my spouse/partner have a commercial or financial interest or relationship with manufacturers of pharmaceuticals, laboratory supplies and/or medical devices.

**No**
- I receive a commercial or financial interest or relationship with manufacturers of pharmaceuticals, laboratory supplies and/or medical devices. Please list source(s) and
relationship(s):

No  My spouse/partner receives a commercial or financial interest or relationship with
- manufacturers of pharmaceuticals, laboratory supplies and/or medical devices. Please list
  source(s) and relationship(s):

No  I refuse to disclose my commercial or financial interests or relationships with
- manufacturers of pharmaceuticals, laboratory supplies and/or medical devices. If you
  check this box, you will not be allowed to participate in this CME activity.

Author: Philip Kumanov, M.D., Ph.D.
Department/Institution: Medical University, Sofia
Address:
City/State/Zip/Country: Sofia, Bulgaria
Phone: Cell Phone: Fax: E-mail: agarwaa@ccf.org

Yes  Neither I nor my spouse/partner have a commercial or financial interest or relationship
- with manufacturers of pharmaceuticals, laboratory supplies and/or medical devices.

No  I receive a commercial or financial interest or relationship with manufacturers of
- pharmaceuticals, laboratory supplies and/or medical devices. Please list source(s) and
  relationship(s):

No  My spouse/partner receives a commercial or financial interest or relationship with
- manufacturers of pharmaceuticals, laboratory supplies and/or medical devices. Please list
  source(s) and relationship(s):

No  I refuse to disclose my commercial or financial interests or relationships with
- manufacturers of pharmaceuticals, laboratory supplies and/or medical devices. If you
  check this box, you will not be allowed to participate in this CME activity.
Yes
- Neither I nor my spouse/partner have a commercial or financial interest or relationship with manufacturers of pharmaceuticals, laboratory supplies and/or medical devices.

No
- I receive a commercial or financial interest or relationship with manufacturers of pharmaceuticals, laboratory supplies and/or medical devices. Please list source(s) and relationship(s):

No
- My spouse/partner receives a commercial or financial interest or relationship with manufacturers of pharmaceuticals, laboratory supplies and/or medical devices. Please list source(s) and relationship(s):

No
- I refuse to disclose my commercial or financial interests or relationships with manufacturers of pharmaceuticals, laboratory supplies and/or medical devices. If you check this box, you will not be allowed to participate in this CME activity.

Author: Nisarg R Desai, M.D.
Department/Institution: Center for Reproductive Medicine, Cleveland Clinic
Address:
City/State/Zip/Country: Cleveland, United States
Phone: Cell Phone: Fax: E-mail: agarwaa@ccf.org

Yes
- Neither I nor my spouse/partner have a commercial or financial interest or relationship with manufacturers of pharmaceuticals, laboratory supplies and/or medical devices.

No
- I receive a commercial or financial interest or relationship with manufacturers of pharmaceuticals, laboratory supplies and/or medical devices. Please list source(s) and relationship(s):
No
- My spouse/partner receives a commercial or financial interest or relationship with manufacturers of pharmaceuticals, laboratory supplies and/or medical devices. Please list source(s) and relationship(s):

No
- I refuse to disclose my commercial or financial interests or relationships with manufacturers of pharmaceuticals, laboratory supplies and/or medical devices. If you check this box, you will not be allowed to participate in this CME activity.

Author: Ashok Agarwal, Ph.D.
Department/Institution: Center for Reproductive Medicine, Cleveland Clinic
Address: Cleveland, United States
Phone: Cell Phone: Fax: E-mail: agarwaa@ccf.org

Yes
- Neither I nor my spouse/partner have a commercial or financial interest or relationship with manufacturers of pharmaceuticals, laboratory supplies and/or medical devices.

No
- I receive a commercial or financial interest or relationship with manufacturers of pharmaceuticals, laboratory supplies and/or medical devices. Please list source(s) and relationship(s):

No
- My spouse/partner receives a commercial or financial interest or relationship with manufacturers of pharmaceuticals, laboratory supplies and/or medical devices. Please list source(s) and relationship(s):

No
- I refuse to disclose my commercial or financial interests or relationships with manufacturers of pharmaceuticals, laboratory supplies and/or medical devices. If you check this box, you will not be allowed to participate in this CME activity.