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Puberty from bench to clinic: Lessons for clinical management of pubertal disorders, J.-B. Bourguignon, A.-S. Parent, editors (Karger, Basel, Switzerland) 2016. 264 pages. Price: US$ 233.00/CHF 198.00/EUR 185.00

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Puberty, a period during which growing children attain secondary sexual characteristics and reproductive capability, is an enchanting and enigmatic topic of endocrinology. It is undoubtedly one of the most perplexing issues of human biology. The pathways regulating the onset of puberty remain one of the greatest mysteries in endocrinology with genetic, physical and physiological factors playing their own roles. This complex and multifactorial pathogenesis of initiation and progression of puberty is gradually unraveling with progressive advances in molecular biology and genetics in the recent years and proper understanding of normal and abnormal pubertal development is opening up new avenues for management of various forms of pubertal disorders. Up-to-date concepts of physiology and pathology of puberty from both animal and human models form the basis of this book.

This book has been systematically divided into 15 chapters with 40 renowned authors contributing to the effort. The book has looked into the interesting issues of puberty from three perspectives: genetic, environmental and therapeutic issues.

The initial part deals with the roles of different genes in the onset of puberty. The first chapter entitled, "The Emerging Role of Epigenetics in the Regulation of Female Puberty" discusses the mechanisms of epigenetic repression and activation of gene transcription and epigenetic regulation of pubertal development. The role of trans-synaptic and glial inputs to gonadotropin-releasing hormone (GnRH), the role of KNDy (kisspeptin/neurokinin B/dynorphin) neurons and the pivotal role of polycomb group (PcG) and trithorax group (TrxG) of chromatin proteins have been discussed clearly in this chapter. The chapter dealing with genetic determinants of pubertal development discusses a wide variety of genes of which *LIN28B* situated on chromosome 6q21 has been identified in several genome-wide association studies (GWAS) and gained importance in recent times for its role in pubertal timing.

The detailed dissection of the culprit genes at times gets a bit difficult to grasp for the practicing endocrinologists but is a veritable goldmine for researchers of the respective subject. The chapter titled, "Genetics of Hypogonadotropic Hypogonadism" deals with the genotypic and phenotypic characteristics of different forms of hypogonadotropic hypogonadism (HH) with a special section on 'syndromic causes of HH'. Interestingly, it has been suggested that *GNRHR* and *TACR3* should be the first two genes to be screened for differentiating idiopathic HH from constitutional delay.

The second part deals with the effects of different environmental factors like nutrition, drugs and endocrine disruptors on puberty. This section also addresses the developmental origins of puberty from maternal factors acting *in utero* affecting the conceptus to the effects of both under- and over- nutrition during infantile and juvenile periods. The effects of early exposure to different endocrine disruptors on the hypothalamo-pituitary-gonadal axis and their puberty and reproduction related outcomes have been discussed in detail.

The last part of the book discusses the treatment modalities in different pubertal disorders. The chapter titled, "Sex Steroid Replacement Therapy in Female Hypogonadism from Childhood to Young Adulthood" deals with the difficult and unresolved issues of pubertal sex hormone replacement therapy in girls. The issues of different formulations of synthetic estrogens and oral or transdermal route of administration have been

discussed in detail. The authors have recommended to use 17-β estradiol matrix patches when available over the other forms of estrogen preparations. However, this particular preparation is not available in India. This chapter also discusses the controversial issues of pubic hair development by androgen-containing gel as a treatment goal in hypogonadal females. The treatment of both central and peripheral precocity has been extensively discussed in this section. The closing chapter moves from the realm of endocrinology to psychiatry with a focus on adolescent biopsychosocial development and evaluation and care of the adolescent during puberty.

The book falters somewhat in not providing sufficient clinical photographs of different pubertal disorders, syndromic forms of hypogonadotropic hypogonadism in particular which could have been useful in day-to-day clinical practice. Moreover, there is repetition of certain issues which could have been avoided.

Overall, the book makes for an intriguing read and is well balanced. The elaborate dissertation on molecular and genetic concepts may not only be of particular interest to researchers but clinicians will also gain from its knowledge base. In conclusion, the book sheds light on the profound complexities of puberty and has the potential to stimulate the development of more effective and innovative techniques for its management.

Subhankar Chowdhury
Department of Endocrinology & Metabolism,
Institute of Post Graduate Medical
Education & Research and
Seth Sukhlal Karnani Memorial Hospital
Kolkata 700 020, West Bengal, India
subhankar.chowdhury@gmail.com