The Bhubaneswar Declaration on Sports Endocrinology, 2018

Sanjay Kalra, Abhay Sahoo[1], Sambit Das[2], K. V. S. Hari Kumar[3], Anoj Kumar Baliarsinha[4], Binoy Mohanty[5], Jayabhanu Kanwar[1], Sunil Kota[6], Sudeep Satpathy[7], Muthukrishnan Jayaraman[8], S. K. Singh[9], S. V. Madhu[10], Mona Shah[11], Narendra Kotwal[12], Gagan Priya[13], Belinda George[14], Arundhati Dasgupta[15], Arun Kumar R. Pande[16], Nikhil Latey[17], Puneet Dhamija[18], John Ayuk[19], David Torpy[20], Pankaj Shah[21], Mohammed Wali Naseri[22], Robin Maskey[23], Zafar A. Latif[24], Noel Somasundaram[25], Ali Jawa[26], Kirtida Acharya[27]

Department of Endocrinology, Bharti Hospital, Karnal, Haryana, [1]Department of Endocrinology, IMS and SUM, [2]Department of Endocrinology, Hi Tech Medical College and Hospital, Bhubaneswar, Odisha, [3]Department of Endocrinology, Command Hospital (WC), Panchkula, Haryana, [4]Department of Endocrinology, SCB Medical College, Cuttack, [5]Department of Endocrinology, MKCG Medical College, [6]Department of Endocrinology, Diabetes and Endocare Clinic, Berhampur, Odisha, [7]Department of Sports Medicine, B R Life Kalinga Hospital, Bhubaneswar, Odisha, [8]Department of Internal Medicine, Army College of Medical Sciences, New Delhi, [9]Department of Endocrinology, Institute of Medical Sciences, Banaras Hindu University, Varanasi, Uttar Pradesh, [10]Department of Endocrinology, University College of Medical Science, [11]Department of Endocrinology, Harmony Clinic, Vadodara, Gujarat, [12]Department of Endocrinology, Army Hospital (R and R), New Delhi, [13]Department of Endocrinology, Fortis Hospital, Mohali, Punjab, [14]Department of Endocrinology, St John's Medical College, Bengaluru, Karnataka, [15]Department of Endocrinology, Rudraksh Superspeciality Care, Siliguri, West Bengal, [16]Department of Endocrinology, Lucknow Endocrine Diabetes and Thyroid clinic and Sahara Hospital, Lucknow, Uttar Pradesh, [17]Department of Physiotherapy, Sports Med Hospital, Mumbai, Maharashtra, [18]Department of Pharmacology, AIIMS, Rishikesh, Uttarakhand, [19]Department of Endocrinology, University Hospitals Birmingham, UK, [20]Department of Endocrinology, Royal Adelaide Hospital, Adelaide, Australia, [21]Department of Internal Medicine, Division of Endocrinology, Mayo Clinic Rochester USA, [22]Department of Internal Medicine, Division of Endocrinology, Kabul University of Medical Sciences, Kabul, Afghanistan, [23]Department of Internal Medicine, B.P. Koirala Institute of Health Sciences, Dharan, Nepal, [24]Director BIRDEM, Dhaka, Bangladesh, [25]Department of Endocrinology, National Hospital of Sri Lanka, Colombo, Sri Lanka, [26]Wilshire Cardiovascular and Endocrine Center of Excellence, Lahore, Pakistan, [27]Department of Endocrinology, MP Shah Hospital, Nairobi, Kenya

Abstract

Sports and endocrinology are complex interrelated disciplines. Sports and exercise modulate endocrine and metabolic health, and are used to prevent and manage disease. Endocrine and metabolic function influence participation and performance in sports activity. The Bhubaneswar Declaration, released on the occasion of the Endocrine Society of India Conference, resolves to promote the science of sports endocrinology. The authors commit to optimize endocrine health in sports persons, encourage safe use of sports to promote health, and prevent misuse of endocrine interventions in sports.

Keywords: Bone heath, calcium, diabetes exercise, hyperandrogenism, intersex, lifestyle modification, physical activity, physical fitness, Vitamin D

Preamble

Endocrinology is a clinical discipline of medicine that studies hormonal functions of the body. Sports is an essential part of the daily life and improves the overall health of an individual. Hormones released in the central nervous system are responsible for the "feel good factor" observed after a bout of an exercise. Ancient medical treatises and alternate forms of medicine also highlight the key role of physical activity in leading a disease-free life. The Greeks and Romans have cultivated sports and physical fitness as a virtue while celebrating endocrine vigor and vitality.

The disciplines of sports and endocrinology share a common philosophy toward the path of glory and success for all involved members. They believe in teamwork, shared decision-making (coach and athlete, patient and doctor), self-discipline, focus on long-term outcomes and coping skills in case of failure. This is exemplified by many persons who have excelled in their sporting careers with adequate support of hormones. To name a few, the list includes Lionel Messi (Football), Wasim Akram and Craig McMillan (Cricket), Arthur Ashe (Tennis), and Gary Hall Jr. (Swimming). There are

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Address for correspondence: Dr. Sanjay Kalra, Department of Endocrinology, Bharti Hospital, Karnal, Haryana, India.
E-mail: brideknl@gmail.com

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many other examples of sportspersons who have not allowed endocrine disorders to act as an impediment to their career and worked in harmony with their endocrine limitations. The interrelation between these two specialties extends beyond hormones, into many other areas including gender identity, doping and hormone abuse, stress, and athletic performance.

Sports in Endocrinology

Endocrinology and sports enjoy a complex, multifaceted relationship as shown in Figure 1. Sports and physical fitness impact the hormonal and metabolic milieu of the body beneficially and are used for both the prevention and management of endocrinopathy. Lifestyle modification, including regular exercise and sports, is useful in the prevention and management of obesity, diabetes, hypertension, osteoporosis, and sarcopenia in adolescents and adults.[1,2] In children, active participation in sports and games helps them attain and maintain optimal bone mass.[3] Exercise is also useful in the prevention of complications of endocrine diseases, such as the diabetes fatigue syndrome, frozen shoulder, and other syndromes of limited joint mobility.

Sports and regular exercise help reduce body weight, improve glucose control, maintain bone density, and muscle mass.[4] Physical activity allows a reduction in the dose requirement of pharmacologic therapy, especially in patients with lifestyle-related disorders such as Type 2 diabetes and hypertension. Aerobic fitness helps enhance cardiac function and improve exercise endurance levels while reducing the risk of hypoglycemia in Type 1 diabetes.[5] Exercise activity is known to improve mood and hence may help in depression associated with such lifestyle disorders By encouraging self-discipline, sports improve adherence of the individual to prescribed pharmacotherapy. However, akin to other therapeutic interventions, sports also have certain limitations. Vigorous, high-impact exercises are contraindicated in patients with severe osteoporosis and Type 1 diabetes in ketosis. Resistance exercises are best abstained from in uncontrolled hypertension or proliferative diabetic retinopathy. Overtraining and extreme sports practice may lead to endocrine disorders like female athlete triad (hypothalamic amenorrhea, eating disorder, and decreased bone mineral density) and hypogonadism in males.[6,7] There is a potential for pituitary or reproductive tract injury in certain sports such as boxing, bicycling, and horse riding.[8]

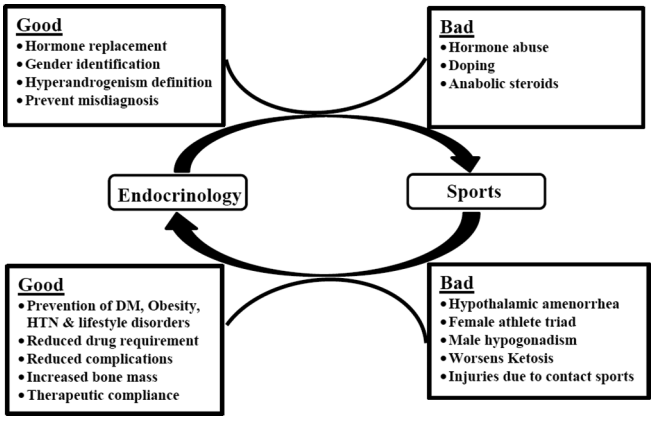

Figure 1: Bi-directional links between the endocrinology and sports

Endocrinology in Sports

Endocrinology offers numerous interventions which can be safely used for sports performance enhancement as shown in Figure 2. Adequate maternal nutrition and correction of the four pillars of transgenerational karma (hemoglobin, blood pressure, glycemia, and weight gain) during pregnancy allows proper growth of the fetus in utero and the birth of a healthy child.[9] This sets the foundation for a successful career in sport, by preventive endocrinology measures designed to facilitate the growth of a healthy mind and body, with efficient bones and muscles. Evidence-based interventions such as good nutrition, regular exercise, adequate sunlight exposure, calcium, Vitamin D help create a sports-loving generation of citizens. During adulthood, the role of endocrinology is in screening, early detection, and timely management of the disorders to prevent the suboptimal sports performance.

Endocrinology pays special attention to gender-related issues in sports. Gender identification and hyperandrogenism are contentious issues about women athletes.[10] Sports endocrinology includes the screening, diagnosis, and management of such conditions in its ambit. It is pertinent to revisit the principles of quaternary prevention in this regard: one must avoid over labeling and over the treatment of endocrine dysfunction at all costs.[11] Sports endocrinology also works to prevent the misuse of anabolic hormones and other interventions in the sports community.[12] The detection, prevention, and management of doping of anabolic steroids, insulin, growth hormone, thyroxine, or other endocrine drugs is an integral part of the discipline. A thorough understanding of the complex interactions between sports and endocrinology can facilitate effective performance on the sports field while ensuring safety and sustainability of sports career as well.

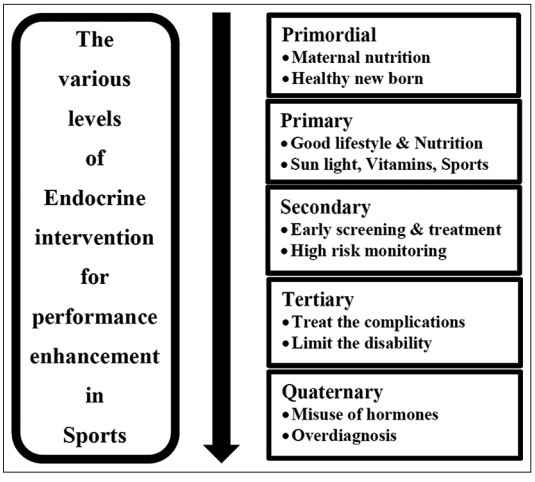

Figure 2: Endocrine levels of intervention

Sports, Endocrinology, and the Society

Sports and endocrinology are dynamic disciplines, which are inexorably intertwined in our environment and the society. A physical environment which is conducive to sports and physical fitness (cycle pathways, open-air gymnasia, and playgrounds) will improve the endocrine health of the community as well. Environmental toxins, exposure to endocrine disruptor chemicals may vitiate not only hormonal function but participation in sports as well.[13] The dangerous Ps (plastics, pesticides, pollutants, and phones) discourage healthy sporting activities in the society. The psychosocial environment of the society is equally relevant to sports and endocrinology. Nonsupportive or hostile psychological and social situations discourage participation in physical and recreational sports. They also prevent persons with endocrinopathy from following appropriate lifestyle modification therapy.

Resolution

We, the participants of the 48th Annual conference of the Endocrine Society of India, from 10 countries spanning all five continents, including endocrinologists, sports medicine specialists, physicians, clinical pharmacologists, and nutritionists, meeting here in Bhubaneswar, India on November 18, 2018, hereby resolve to:

- Promote the subspecialty of sports endocrinology within the disciplines of endocrinology and sports medicine
- Facilitate optimization of endocrine health in sportspersons, on and off the sports field
- Encourage appropriate use of sports to prevent and manage endocrine and metabolic dysfunction
- Prevent misuse and abuse of endocrine interventions in the field of sports and elsewhere
- Minimize the potential of endocrine and metabolic injury or dysfunction due to sports
- Promote the interest in sports endocrinology among the medical fraternity.

To achieve the above-mentioned objectives, we resolve to work with all stakeholders from relevant disciplines, including sportspersons, coaches, policymakers, and sports administrators. We will also utilize all feasible means of communication to spread awareness about the endocrine health in sports and optimal use of sports in the management of endocrine disorders.

Conclusion

Endocrinologists are committed to ensure and safeguard the endocrine and metabolic health of the community, whereas sports medicine specialists facilitate healthy participation in sports activities.[14] Together with other stakeholders, we will work to ensure a seamless and universal connection between sports and endocrine health. We are optimistic that the evolving field of sports endocrinology will ensure health and vigor in humankind.

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Conflicts of interest

There are no conflicts of interest.

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