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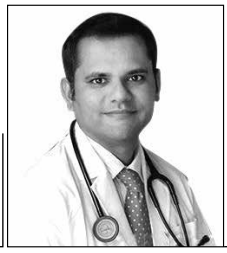

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Osteocrinology: Insights from the Great Indian Epics

ABSTRACT

Indian epics are a storehouse of knowledge and information, which offer an insight into various aspects of health and disease. In this paper, we surmise some of the legendary figures in the great Indian epics, who possibly could have disorders related to osteocrinology. Based on the detailed description provided in Vedic texts, these exemplars from Indian history provide an interesting framework for the study of osteocrinology. These may spark an interest in students and researchers to explore and understand this subject in greater depth.

Keywords: Osteocrinology, Indian epics, metabolic bone disease, Mahabharata, Ramayana

The depth and details of description provided in the great Indian epics provides an opportunity to study and reckon one of the earliest descriptions of medical disorders in history. Modern endocrinology also finds echoes of contemporary diagnosis and management in these ancient literary classics.[1,2] Numerous characters and events in the Ramayana and Mahabharata have previously been related to endocrine disorders involving the hypothalamic-pituitary axis and the reproductive system in relation to reproductive endocrinology.[3] Osteocrinology is a rapidly upcoming subspecialty of endocrinology, which deals with management of metabolic bone disease (MBD). In this paper, we surmise some of the legendary figures in the great Indian epics who have been suspected to have disorders related to osteocrinology. This is based on the detailed description provided in these Vedic texts.

The earlier descriptions of osteocrinology date back to 1000 years BC. The Egyptian God Bes and Aesop have been depicted to have achondroplasia and an Egyptian mummy dating back to 1000 BC has been described with osteogenesis imperfecta.[4] In the first century AD, the Greek physician Soranus described bone deformity in infants.[5] Daniel Whistler from England described rickets in 1645, and in 1876, Paget described osteitis deformans, later to be known as Paget's disease.

EXAMPLES FROM THE GREAT INDIAN EPICS

Indian literature, which predates these milestones, offers a picture of MBD through the portrayal of its characters. Several examples have been cited below from Ramayana, Mahabharata, Bhagavata Purana, etc.

Manthara

Manthara, Kaikeyi's housemaid in the Ramayana, is described as having a hunchback.[6] This is further supported by another less commonly cited story wherein she broke her knee while Rama was playing in the garden and struck a stick on her leg. These examples suggest that she had a probable fragility fracture and a hunchback could be indirect evidence of multiple vertebral fractures. Since she was old when she has been shown to have these features, it is likely these may have been secondary to postmenopausal osteoporosis. Moreover, they were not life-threatening as she has been mentioned to survive the entire period of exile that Rama had spent outside Ayodhya.

Kubja

A similar phenotype is ascribed to Kubja, or Trivakra (three bends), a maid servant from Mathura who is healed by Lord Krishna's touch. She has been believed to be a reincarnation of Surpanakha in Rama's time and is mentioned in other scriptures as having a hunchback. Given her younger age, reversibility and bony deformities it probably could represent a treatable cause of osteomalacia.[7]

Shakuni

Other example of a possible MBD can be considered as a differential diagnosis of Shakuni's phenotype. Shakuni, also known as Saubala, walked with a limp, purportedly due to his father striking him on the thigh, to remind him of the pain his brothers had experienced. Moreover, there is also a mention of a prolonged imprisonment with limited food for Shakuni during early days. This may have induced a nutritional osteomalacia in him predisposing to develop a permanent deformity following the traumatic injury by his father. His intelligence and strong political farsightedness is well known.

Ashtavakra

MBD is not confined to persons from lower socio-economic strata, or to characters depicted as villains. The saga Ashtavakra (eight bends) was cursed *in-utero*, and was born with eight physical deformities. A man of wisdom, he wrote the Ashtavakra Gita, which is a seminal work on dualistic philosophy. Osteogenesis imperfecta is one diagnosis which is definitely plausible. Among other causes of juvenile osteoporosis, a genetic defect, including *LRP5* mutation, may be possible.

CONCLUSION

Indian epics are a storehouse of knowledge and information, which offer insight into various aspects of health and disease. This brief compendium of osteocrinology, as described in Indian epics, creates an interesting framework for the study of the subject. Similar examples from history and mythology can be collated to spark interest in students and practitioners of medicine.

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Carboplatin Increases the Rate of Cure for Cancer

According to the report by the Tata Memorial Center, a commonly available and inexpensive drug, carboplatin, increased the cure rate and survival of a very aggressive type of breast cancer, especially among young women. In the randomized controlled trial, women with stage II to III triple-negative breast cancer were enrolled between 2010 and 2020. The enrolled women were divided into two groups.

In the study, women in the standard treatment group received standard chemotherapy consisting of once-per-week paclitaxel for 8 weeks followed by doxorubicin plus cyclophosphamide every 3 weeks for 4 cycles. In the treatment group, women received the same chemotherapy with the addition of carboplatin injections once per week for 8 weeks, given with paclitaxel. According to the study's author, the study had four major findings. Firstly, the population cure rate (5-year disease-free survival) increased by 6.6% from 64.1% in the standard arm to 70.7% in the treatment arm. Secondly, the overall survival increased by 7.6%, from 66.8% in the standard arm to 74.4% in the treatment arm. Thirdly, when the results were analyzed by age, the benefit of weekly carboplatin was almost exclusively confined to women younger than 50 years. Fourthly, the cure rate and overall survival rate increased by 12.5% and 11.2%, respectively, in women younger than 50. (*Source: https://www.daijiworld.com/news/newsDisplay?newsID=1028827*)

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