

The Mahabharata and reproductive endocrinology

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ABSTRACT

This communication approaches the Mahabharata through the prism of reproductive endocrinology. Descriptions of episodes related to reproduction are listed here, to provide fodder for the endocrinologically minded brain. The cases described here are perhaps, the first documented observations of fetal orgasm, pseudocyesis and assisted reproductive technology, including assisted insemination by donor, induction of ovulation, and *in vitro* fertilization as well as precocious growth and intersex. We do not presume to offer a definite explanation for these interesting episodes from the Mahabharata. We do, however, hope to stimulate interest in ancient Indian literature, and encourage a literary “forensic endocrine” analysis of events relevant to our specialty.

Key words: Assisted reproductive technology, endocrinology, Mahabharata

INTRODUCTION

The Indian epic, the Mahabharata, is an encyclopedic coverage of ancient history.

“Whatever is here, may be found elsewhere; what is not cannot be found anywhere else,” The Epilogue to the Mahabharata exclaims with pride (18:56-33).

We approach the Mahabharata through the prism of reproductive endocrinology, searching for examples of reproductive health and disease in this voluminous text.^[1] We limit ourselves to endocrine episodes described in the Mahabharata as published by Tirumala Tirupati Devasthanams. Descriptions of episodes related to reproduction are listed here, to provide fodder for the endocrinologically minded brain. Through this, we hope to stimulate interest in ancient Indian literature and encourage a literary “forensic endocrine” analysis of events relevant to our specialty [Table 1].

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Access this article online

Quick Response Code:



Website:
www.ijem.in

DOI:
10.4103/2230-8210.180004

FATAL COITUS

Pandu, the king of Hastinapura, was cursed by a sage to die if he indulged in coitus. Pandu had shot at a mating pair of deer, who were actually a sage and his wife.

Pandu remained mentally upset, as he could not procreate. One day, however, his hypophyseo-gonadal axis got the better of him, and he invited his second wife, Madri, to his conjugal bed. This momentary lapse cost him his life. Such situations are described in the modern medical literature. Various differentials can be suggested to explain this clinical situation: Subarachnoid hemorrhage,^[2] a ruptured cerebral aneurysm or a ruptured aortic aneurysm come to mind immediately. The sexual practice of cunnilingus (blowing air into the vagina) is a predisposing factor for fatal coitus in women.^[3] A plausible endocrine diagnosis is a pheochromocytoma, with pho crisis, precipitated by coitus. Yet another endocrine iatrogenic cause of fatal coitus is the use of phosphodiesterase 5 inhibitors such as sildenafil.^[4]

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Cite this article as: Kalra B, Baruah MP, Kalra S. The Mahabharata and reproductive endocrinology. Indian J Endocr Metab 2016;20:404-7.

PROLONGED GESTATION OR PSEUDOCYESIS

The Mahabharata lists a 100 Kauravas, and one daughter, who were born to Gandhari and Dhristrashtra. The epic describes Gandhari as having a prolonged gestation, after which she gave birth to a lump of immovable flesh.

Prolonged gestation is documented in modern medical records, and can be due to a variety of causes. The record for the longest pregnancy is 375 days.^[5] It is plausible, however, that Gandhari's "pregnancy" was a case of pseudocyesis. It must be noted that at about the same time, Gandhari's sister-in-law, Kunti, had conceived and delivered her first son Yudhishtira. There would have been social pressure on Gandhari to produce an heir to carry on the Kuru lineage. This might have precipitated symptoms and signs of pseudocyesis, as happened in a later monarch, Queen Mary of Scotland.^[6] The news of a "still birth" could have been a face-saving device, designed to ward off uncomfortable comments.

Gynecological differentials include delivery of uterine casts and submucous fibroids.^[7,8]

EXTRA-UTERINE MANIPULATION: *IN VITRO* FERTILIZATION

Gandhari's story did not end with a "still birth." As the legend goes, the "fetus" was divided into a hundred pieces, which were put in jars to which ghee (clarified butter) was added, and incubated. Finally, 101 children were born, one by one.

This narrative is strongly reminiscent of *in vitro* fertilization (IVF), with the multiple pregnancies that commonly occur with it.^[9] In Gandhari's case, however, the description mirrors an extra-uterine gestation, a scientific feat that future researchers may be able to achieve.

PARTHENOGENESIS

Many examples of parthenogenesis are described in the Mahabharata. The sage Durvasa had blessed Kunti, daughter of King Kunti Bhog, with a boon. He initiated her into a unique mantra, through which she could invoke any divine being to provide her with a son. Kunti conceived her first son, Karna, from Surya, the Sun God, as a virgin, and had to abandon him. Her later children, Yudhishtira, Bhima, and Arjuna, were conceived using this mantra, at the behest of her husband, Pandu, who could not perform coitus without surviving. The same mantra was used by Kunti to allow her co-wife, Madri, to conceive Nakula and Sahdeva. The "fathers" of the five Pandavas were Yama, Vayu, Indra and the twin Ashwins.

The "divine birth" or asexual reproduction detailed in the Mahabharata, is an example of parthenogenesis, which is frequently encountered in comparative endocrinology. Parthenogenesis is suggested to be an evolutionary adaptation in vertebrate species by some.^[10]

INDUCTION OF OVULATION

Other means of assisted reproductive technology (ART) have been described in the epic. The King Brihadratha, who had infertility, was given a mango by the sage Kaushik, to give to his queen. Brihadratha divided the mango into two, giving one-half to each of his two queens. Each queen gave birth to a "half-child" As the products of conception were presumed still-born, they were disposed of in the garbage. A rakshasni (demoness) who came by, search for food, found that the two halves merged to create a living child, who was named Jarasandha. This child grew up to be strong, but harsh, king, who remained undefeated until Bhima tore his body into two halves and threw them in opposing directions.

This episode suggests administration of an oral agent for induction of ovulation, similar to those used in modern gynecological practice.^[11]

MATERNAL PROGRAMMING/EPIGENETICS

"Surrogate fatherhood" a socially accepted phenomenon in the past is described in the Mahabharata. Faced with the possible extinction of her lineage, Queen Satyawati requests her son, Ved Vyasa, to cohabit with her widowed daughters-in-law, Ambika, and Ambalika, to sire progeny. As history states, Ambika closes her eyes at the sight of the bearded Ved Vyasa, and a blind son, Dhritrashtra, is born. The other daughter-in-law, Ambalika, turns pale upon seeing Ved Vyasa, and a son with pallid complexion (? albinism), Pandu, is the result. The next time, Ambalika sends a confident palace maid in her place, and a perfectly healthy son, Vidura, is the result of this contact.

Whether environmental factors have a role to play in intrauterine development is an important debate in the medical circle today.^[12] The birth of sons with varied limitations, linked to maternal "psychosocial" environment at the time of conception, is perhaps the first recorded case of maternal programming or epigenetic impact.

PHEROMONES/THE GONADO-CEREBRAL AXIS

"Men in the prime of their youth are prone to develop psychological peculiarities in the company of young women and become proud,

and transgress all canons of propriety” Angaraparna, to Arjuna, while explaining his rude behaviour.

Such endocrine reactions and phenomena are known to all. The impact of the external environment on hormones, including stimulation of the hypophyseal-gonadal axis and its resultant multi-systemic effects, is well-understood.^[13] It must be noted that the Mahabharata contains the first reported documentation of this endocrine phenomenon.

POSTPARTUM CHANGE

“A woman will cease to care for her husband after she becomes a mother.”

Mandapala, the male bird, on being spurned by his wife, Jarita, after the Khandava prastha fire.

We have focused so far on Mahabharatiya events related to conception, pregnancy, and parturition. Yet, in at least one parable, the author of the Mahabharata describes postpartum changes on well. When the Khandavaprastha forest was about to be set ablaze, the male bird Mandapala was on a visit to his paramour. On returning, the first thing, he did was to ask his wife Jarita about the well-being of their children. Jarita, however, spurned him, telling him to go back to his lover. It is in this content that Mandapala complains about the postpartum lack of interest evinced by his wife.^[14]

PRECOCIOUS GROWTH

In the Mahabharata, it is clearly mentioned that Karna, son of Kunti and Surya, the sun god, was born with natural armor and earrings. This phenomenon suggests a congenital anomaly. However, Karna grew up to into a handsome and capable prince warrior, with no suggestion of any of the disabilities associated with most congenital syndromes.

Rishi Ved Vyasa, the author of the Mahabharata, has provided detailed word pictures of events and personalities. It is hard to believe, therefore, that he would have confused “natural armor” with a congenital ichthyosis.” Plausible differentials include thick vernix caseosa, ichthyosis vulgaris, and external earlobe anomalies.^[15] (courtesy Dr. V Srinagesh, Dr. Mudita Dhingra).

INTER SEX

The third child of King Drupada, Amba, performed severe penance to obtain a boon to be able to kill Bhishma, whom she felt had insulted her and spoiled her life. However,

Bhishma was invincible and could not be felled by any man. Therefore, Amba was reborn as a girl Sikhandini, who later on exchanged her womanhood with a yaksha and returned as a man. Even so she was not fully accepted as being male and was derided for his sexual built.

This complex character from the Mahabharata throws up various endocrine issues regarding intersex,^[16] and the sex of rearing. The issue is the subject of an exhaustive book, *The Pregnant King*,^[17] which delves into the intricacies of intersex. We suggest this book as a must read for every health care professional who wishes to manage intersex in an empathic manner.

MALE PREGNANCY

In a simple prank on some visiting rishis, a few frivolous Yadava youth dress up a boy Samba as a pregnant woman, asking the rishis the gender of the unborn child. Offended, the rishis predict the birth of an iron mace which will destroy the Yadava race. This prophecy finally comes, and the first step is that of Samba developing labor pains and delivering an iron mace.

Male pregnancies are theoretically possible, with today’s technology allowing womb transplants and hormone supplementation.^[18] However, explaining Samba’s experience, as mentioned in the Mahabharata needs an extremely fertile endocrine imagination. It is plausible that faecoliths or stones were delivered per rectum or per urethra, and were documented as labor and delivery [Table 1].

SUMMARY

The cases described here are perhaps, the first documented observations of fetal orgasm, pseudocyesis and ART,

Table 1: Endocrine events of interest in the Mahabharata

Endocrine phenomena	Examples
Related to conception/birth	
Fatal coitus	Pandu
Maternal programming	Blindness of Dhritrashtra pallor of Pandu
Precocious growth	Karna’s earrings and natural armor
Related to assisted reproductive technology pseudocyesis?	
Pseudocyesis?	Gandhari
In vitro fertilization?	Gandhari’s 101 children
Induction of ovulation	Mothers of Jarasandha/split mango
Parthenogenesis	Sons of Kunti and Madri
Related to pheromones	
Effect of young women on young men	Angaraparna
Related to most partum change	
Lack of interest	The birds Mandapala and Jarita

including assisted insemination by donor, induction of ovulation, and IVF as well as precocious growth and intersex. We do not presume to offer a definite explanation for these interesting episodes from the Mahabharata. We do, however, hope to excite curiosity, and encourage the spirit of forensic endocrinology in our readers. This will enrich the study, as well as the teaching of medicine in general, and endocrinology in particular. The ancient Sanskrit as well as other Indian literature provides fertile ground for such efforts to bloom.

We conclude with a quote from Vidura, the learned statesman of Hastinapura, speaking to his half-brother, Dhritrashtra.

“It is my duty to offer my counsel to you without fear or favor. It is for you to accept it or reject it.”

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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