

Use of Pregnant Cow Urine for Androgenic Alopecia in Medieval India

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Abstract

Introduction: The modern era of sex hormone began less than 100 years, and the role of endocrine factors in Androgenic Alopecia (AGA) was recognized by modern medicine only around 75 years ago. It has been suggested that oestrogens may inhibit the peripheral action of androgens. Pregnant mare urine, natural source of oestrogens, has been used since around 75 years for various indications associated with menopause and is of potential benefit in treatment of AGA. **Methodology:** A detailed and in-depth semantic analysis of (i) the name *Indralupta*, used around 2500 years ago by Suśruta to denote a type of alopecia and, (ii) the medications prescribed in two *Maṇipravālam* (medieval Malayālam which is admixed with Sanskrit) medical poems, dated to early 1300s CE, was done so as to identify whether the meanings are pertinent to the underlying character of the disease and principle of management. This was done as part of a project aimed at identifying any system of nomenclature of organs, diseases, drugs, etc., the link between these and areas where principles of *Āyurvēda* correlate with those of Modern medicine. **Results:** The analysis shows that semantically, *Indralupta* is same as AGA and that the medieval *Āyurvēdics* had used pregnant cow urine for its treatment. **Conclusion:** The findings indubitably establish that *Āyurvēdic* physicians had the clear concept that: (i). A virilising substance in the body caused *Indralupta*, (ii). Pregnant women have antagonists to this which is excreted through urine, and (iii). Local application of these would be effective in antagonising the virilising one. These are the same as the modern concepts of AGA and its management, thereby underscoring the scientific nature of *Āyurvēda*, even as per the standards of modern science. It is also concluded that that the method of semantic analysis used here is a feasible and appropriate method to bring out hidden knowledge in *Āyurvēda*

Key words: *Indralupta*, *Androgenic Alopecia*, *gōmūtra*, *pregnant cow*, *Maṇipravālam*

Introduction

Āyurvēda is one of the oldest medical systems in the world, with systematically written treatises like the *Samhitās* of *Suśruta* and *Caraka*, and the *Aṣṭāṅgahṛdaya* of *Vāgbhaṭa*. Drugs have been developed from medicinal plants used in *Āyurvēda*, but its treatment regimens have not become accepted by practitioners of modern medicine. With a continuous history spanning more than two millennia, it is a living and still developing practice all over India.^[1]

Āyurvēda made an inroad into Kēraḷa, the small state in south-western India, with the establishment of treatment facilities by Emperor *Aśōka* (304- 232 BC) as mentioned in the *Girṇār* Edicts.^[2] These also mention that raw materials for medicines were imported from neighbouring places. One among these places could have been Kēraḷa since it is rich in medicinal plants even now and would have been much more so back then. It is likely that a medical system existed in Kēraḷa even at that time which could have already identified the plants. Kēraḷa could have made contributions to *Āyurvēdic* knowledge, especially in the field of therapeutics. This can be surmised from the fact that apart from the classical, Kēraḷa has a regional version of *Āyurvēda*. Compendiums are found recorded in palm-leaf manuscripts in the possession of physician families of ancient lineage. Among them are eighteen families of *vaidyās* (physicians), experts in all the eight (*aṣṭa*) branches of *Āyurvēda*, one of them being the *Ālattūr Nambis*.^[3]

Modern concepts in Āyurvēda?

Despite a fundamental principle totally at variance with it, *Āyurvēda* has successfully withstood the onslaught of Modern medicine in the treating human beings implying that there may be something akin to modern science hidden in its principles. An impediment to further investigation of this aspect is the belief that, being steeped in mythology, religion and philosophy, the ancient Ayurvedics could not have had any inkling of ‘modern medical principles’. But, such information could be couched in flavoured language,

presented as allegories or myths with hidden meanings, for easy memorising, similar to the use of mnemonics by students of modern medicine. Allegories can be tailored to even *purāṇic* stories, on the premise that everything in the external universe is present in the human body, including even the Gods. Glimpses of these are seen here and there.

Instances of knowledge in the Purāṇās analogous to that in modern medicine

Sañjñā, *Sūrya*'s (Sun God) first consort, could not stand his glare and heat; therefore she created an image of herself, named her *Chāya*, placed her near *Surya* and left to a distant place to reside in. The Sanskrit word *chāya* means image and *sañjñā* means recognition, understanding, etc. If *sūrya* is taken as light, *chāya* as image and *sañjñā* as the interpretation, the story can be seen to be an allegory sketchily explaining vision, with light producing an image (*chāya*) in the retina whereas the interpretation (*sañjñā*) occurs in the far away occipital lobe.

The microscopically visible 16 celled zygote is named 'morula' because of similarity in appearance to the fruit of the Indian mulberry tree, *Morus indicus*. The Sanskrit name for this fruit is *brahmabīja*. Since *Brahma* is the God of creation and *bīja* means seed, *brahmabīja* essentially means 'creator seed', an apt name for zygote.

Emperor *Nimi* was cursed to occupy human eyes causing their closing; thus the name '*nimiṣa*' for the time duration 'blinking of an eye'. The Sanskrit term for emperor is '*Cakravartin*', a compound of the words *cakra* (circular) and *vartin* (exists) which, taken together, means 'that which exists circularly'. *Orbicularis oculis*, the muscle involved in closing of the eyes, exists as a circle occupying the eyelids and encircling the orbit. The story can serve as a mnemonic to remember the name and action of this particular muscle.

Names of Gods have been given to body parts. The right eye is known as *Indra* (King of Gods) and the left as *Indrāṇi*, his consort. A king and his consort always function together, same as the pair of eyes. Eyes are

the most important *indriyās* (sense organs, as belonging to *Indra*) and therefore naming them *Indra* and *Indrāṇi* is very apt.

In addition to these, previous semantic studies of lexical items clearly show that the ancient people did have a good knowledge of human biology, a necessary prelude to other medical knowledge.^[4, 5, 6, 7]

Background of the study

Linguistic research in Āyurvēda: The need and scope

The need to explain the basic principles of *Āyurvēda* in a manner understandable to modern science has been well recognised and avenues suggested, including critical literary and conceptual studies.^[8] But, the question is how to conduct such studies.

It is clear from the given instances that the ancients also had a high level of linguistic capability, especially semantics, as evidenced by the very meaningful names given with contextual relevance. The original meanings of words could be forgotten or changed; even the fact that there was a contextually relevant meaning could also have been forgotten. This awareness brings to attention the wide scope of in-depth semantic analysis in the forefront of any linguistic approach to conceptual research on various unexplored areas on the fundamental and clinical aspects of *Āyurvēda*. There are many such areas. The procedure for naming of a disease and selection of drugs for its treatment are not clear, calling for research on the link between disease and drug nomenclature. This is important when hitherto unknown diseases appear. A related area is the use of animal urine as well as the proposition that urine and milk of cows with certain skin colours are superior (*vide infra*), both unacceptable to modern medicine. Obviously, the general approach would be to examine in detail the semantics of the names of the organs affected, the diseases as well as the plant or animal or the part used, and identify links which could provide a clue as to the extent

and depth of their knowledge as related to modern concepts. The same method can be applied to recognize any modern scientific principles hidden in *Āyurvēda*. This is essentially linguistic research as applied to biology and medicine. But the question remains as to where and how to undertake the study; i.e. the selection of the specific area of *Āyurvēdic* literature.

Suitability of Maṇipravāḷam medical verses for Linguistic Research in Āyurvēda

Malayāḷam, the language of Kēraḷa, is Dravidian heavily influenced by Sanskrit (an Indo-European language) with more than three-quarters of the words being of Sanskrit origin. *Maṇipravāḷam*, an early medieval style of *Malayāḷam*, was used to write poetry not only of the literature genre but also medical verses with literary merit. *Līlātilakam* (1375 CE), the first Malayalam grammar book, mentions verses termed *Ālattūr Maṇipravāḷam* describing various medical preparations which suggests that they were written at a prior date. The *Ālattūr* family is mentioned in the *Maṇipravāḷam* poem *Uṇṇunīlisandēśam* (circa 1350 CE) showing that they had practised *Āyurvēda* earlier to this and that *Ālattūr Maṇipravāḷam* may be dated to the early 1300s. Unlike other poems, medical verses are kept secret, transmitted in the same family through generations possibly as an oral tradition, and closely guarded in the inside chambers even if written down. It is possible that composition of *Maṇipravāḷam* medical verses could have started very early, soon after *Aśōka's* period but not disseminated generally.

The hallmark of *Maṇipravāḷam* poetry is the abundance of Sanskrit words with or without *Malayāḷam* affixes, *Malayāḷam* words with Sanskrit affixes and almost total disregard for grammar, their comprehension requiring deep insight regarding the meanings, or rather the intended meanings, of the words used. For example, one verse advises the use of *a-nimiṣa-nayana* (the non-blinking-eyed), a Sanskrit word meaning fish. The uninformed may think that use of fish is advised; but the well-informed will understand that fish, indicates 'mīn' (fish) which in turn connotes the plant 'mīnāññāṇi', the first two syllables of which are also 'mīn', both being *Malayāḷam* words. This is done mainly to adjust the *mātra* (syllable duration) to the metric requirement; it may also cloak the truth from quacks. This suggests the

possible presence of many lexical items needing intellectually challenging semantic analysis.

The perceived advantage of using Manipravalam medical verses is that names of diseases, plant sources, drugs as well as treatment modes are given both in *Malayālam* and Sanskrit. This will broaden the scope as well as improve the chance of successful semantic analysis leading to better decipherment of *Āyurvēdic* principles involved, and also identify Kēraḷa's contribution to this science. Consequently, a Research Project on this was undertaken with the following objectives.

Objectives

i.) Preparation of an index and grammatical categorisation of all lexical items. ii.) In-depth Semantic analysis of the diseases names, the names of the source plant of the drugs as well as any other interesting item. iii.) Identify any possible principles of nomenclature of organs, organ systems, diseases, drug source plants, etc. iv) Identify reasons for considering an excreta like urine as being beneficial for specific conditions. v.) Identify areas where *Āyurvēdic* principles possibly conform to those of Modern medicine, as a very important corollary to the above.

Materials and Methods

Selection of the Maṇipravālam medical verses

The University of Calicut, Kēraḷa, obtained a collection of the *Maṇipravālam* verses, in palm-leaf manuscript form, from a source related to the *Ālattūr Nambis*, which was subsequently deciphered,

interpreted and published as ‘*Ālattūr Maṅṅpravālam, the Medical Book*’.^[9] Another collection of ancient *Maṅṅpravālam* medical verses, titled *Yōgāmṛtam*, was first published in 1853 and many times later.^[10] It has been postulated that these too could be the *Maṅṅpravālam* verses mentioned in *Līlātilakam*.^[11] Both are compendiums of treatment prescriptions for various diseases, generally one verse for one disease, and both were selected.

Method of analysis

The names of diseases, plants used and mode of administration given in the various verses are collected. Compound words are split to the component ones. Occasionally the names of characters from potentially allegoric stories also need analysis. Each word can have very many meanings in the case of Sanskrit and *Malayālam*. The different meanings of the compound as well as the component words are collected from appropriate dictionaries, namely the searchable database having the Cologne Digital Sanskrit Lexicon (Monier-Williams' 'Sanskrit-English Dictionary') and the Capeller's Sanskrit-English Dictionary (<http://www.sanskrit-lexicon.uni-koeln.de/scans/MWScan/tamil/index.html>) in the case of Sanskrit and the 1987 edition of *Śabdātārāvali* by Padmanabha Pillai in the case of Malayālam. These meanings are like pieces of a jigsaw puzzle, with only few of them pertinent to the identification of the nature of disease or its remedy, the link between them and any correspondence with modern scientific basis of therapy. Adequate knowledge of modern biology and medicine, *Āyurvēda*, *purāṅic* stories as well as research experience helps intuitively reach a logical and valid conclusion. The etymology of the corresponding name in modern medicine may be helpful to give additional support since European languages and Sanskrit belong to the same family and this was collected using the Online Etymology Dictionary (<http://etymonline.com/>). The study is on-going and this paper, dealing with two verses, presents its first result.

Results

Two verses, one from each compendium, prescribed urine of pregnant cow along with other medicines and the procedure for the treatment of a type of baldness termed as '*Indralupta*' in the *Yōgāmṛtam* and '*Vāsavaliptanōy*' in the *Ālattūr* book. In both, pregnant *gau* (cow; *vide infra*) urine (pregaurin) is not mentioned as such, but intimated in such a way that it can be grossly misinterpreted, as mentioned earlier. The *Yōgāmṛtam* terms it as '*mātu:kaḷal*' (mother's *kaḷal*) *kaḷukiya* (washed) *nīr* (water) and the *Ālattūr* book as *karutta* (black) *go* (cow) *mutra* (urine).

Semantic analysis of the disease names Indralupta and Vāsavaliptanōy

In Modern medicine, a disease may be named after a person who suffered from it, even if it be a character in a story. One example is Pickwick Syndrome with features same as those exhibited by Mr Pickwick, a character in Charles Dickens' 'The Pickwick Papers'. Ayurvedic physicians too could have done the same. The use of the names *Indra* and *Indrāni*, without any mythological implication, for the pupils of the right and left eye has been mentioned earlier. Therefore, based on the premise that mythological names can have different connotations when applied to bio-medical sciences, an attempt is being made to find out whether there was any such reason to assign the epithets of *Indra* to any alopecia.

Indra, the King of Gods, has his own heavenly court and a libertine character.^[12] He once had an affair with *Ahalya*, the wife of Sage *Gautama*, by impersonating the sage. *Gautama* came to the know and cursed *Indra* causing his testicles to fall off and body to be covered by one-thousand vaginae.^[13] Bio-medically, it may be seen that *Indra* here symbolises virile power or androgenicity, and the falling away of the testes and appearance of the vaginae connotes castration.^[14] *Indriya* (belonging to or fit for *Indra*) also means virile power. Andro- is presumably from the Proto-Indo-European (PIE) root *ner**-. But its phonetic similarity with *aindriya*, which means sensual pleasure, is striking. Another name of *Indra* is *Vṛṣa*, the root

of the word *vr̥ṣaṇa* (testis). These provide further links between *Indra* and virility. *Lupta* means loss; therefore *Indralupta* obviously indicates androgenic alopecia (AGA) when applied to hair loss. The naming principle here is almost same as that of modern medicine. *Vāsava* is an epithet of *Indra*. *Lipta*, Sanskrit, means defiled, envenomed, etc., and *noy*, Malayālam, means sorrow. Hence, *Vāsavaliptanoy* means ‘sorrow (the sorrow here being alopecia) by *Vāsava* (androgenic) defilement’, which is same as *Indralupta*. *Vāsavaliptanoy* was chosen probably to fit the metric of the verse.

Semantic analysis of the medication names mātu:kaḷal and kaṛutta gōmūtra

Mātu is a variant of Sanskrit *māta/mātr̥* (mother), and *kaḷal*, Malayālam, generally indicates the feet. The verse seems to advise the use of “water with which ‘mother’s feet’ had been washed”. A medical system that so appropriately named an alopecia cannot be as unenlightened as to give such an inappropriate advice; it can be surmised that *mātu:kaḷal* has a hidden, relevant meaning. *Kaḷa* (ache, strain), the root of *kaḷal* used here, is also the root of the verb *kaḷaluka* (become swollen). In the past, lacking other modes of transportation, people had to move about on their feet a lot. Consequently, the feet were the parts that got strained, ached and swollen and *kaḷal* became identified with the feet. The *kaḷal* (the part that is swollen and strained) of a pregnant woman is the pregnancy itself. Hence, *mātu:kaḷal*, in this instance, obviously means a ‘mother co-existing with her *kaḷal*’, i.e. a pregnant female, and ‘*mātu:kaḷal* washed water’ is the water that has washed the *inside* of her body, namely her urine. In English ‘to make water’ means ‘to urinate’. Since cows are given a place of pride as *gō-māta* (Cow Mother), *mātu:kaḷal* washed water obviously means pregaurine.

Kaṛutta is a Malayālam adjective meaning black; *go* and *mutra* being Sanskrit. If black is taken in its usual adjectival sense of cow’s skin colour, ‘*kaṛutta gōmūtra*’ means urine of a cow with black skin. A colour represents not only the perception of light rays (or lack of them) but also many aspects of thought. Black can mean gloomy, evil, wicked, etc., examples being blackmail, black money, black sheep, etc. *Kaṛutta* is a compound word, *kaṛa+utta*. The suffix *utta* is Malayālam variation of the Sanskrit *ut-*, derived from the

preposition *ud-*, meaning risen, existence, etc. Therefore, *karutta* means ‘that in which *kaṛa* has risen/exists’. *Kaṛa*, apart from blackness, has meanings such as stain from unripe fruits, menstrual blood, blemish, rust, moral offence, sin, etc. Menstrual blood is not applicable here since cows do not menstruate. One possibility is pregnancy, which is in conformity with the meanings of *kaṛa* such as blemish, moral offence, sin, etc. An embryo is a blemish in the body having risen out of a sin, a moral offence. Hence, it can be rightly interpreted that the term ‘*karutta gōmūtra*’ means pregaurine.

Since *Gautama* had cursed *Indra*, and *Indra* connotes androgenicity, it will be worthwhile to see if the word *gautama* has any antagonistic connotation. The word *gau* too means cow, as in *gau-lakṣana* (mark of a cow), *gau-lōmana* (cow’s hair), etc. *Tama* means darkness, night, etc., symbolising coldness or lack of heat. Therefore, ‘*gau-tama*’, in this instance, means a ‘cow not-in-heat’. A pregnant cow is not in heat; therefore *gautama* symbolises a pregnant cow and thus female hormones which have anti-androgenic effect. Here too, a mythological story has a relevant bio-medical connotation supporting the contention that *karutta gōmūtra* means pregaurin.

Other medicines and treatment procedure

The *Ālattūr* book advises that the flower of a medicinal plant be made into a paste with pregaurin and applied to the involved area after blood-letting by multiple nicks on the scalp. *Yōgāmṛtam* advises blood-letting in the area using medical leeches, local application of a medicinal plant powder followed by application of pregaurin as a *dhāra* (continuous pouring from a height). The nicks and bite points could serve as a route of entry for the medicines applied locally.

Discussion

The word 'bald' is of uncertain origin, supposedly from the PIE root *bhel (bright, shining,) which is also the root of the Sanskrit *phalam* with same meaning. A more likely derivation is the phonetically similar 'balada' which means strength (*bala*) giving (*da*); *bala* also means semen. *Bala-dviṣ* (*dviṣ*=foe) means foe of *Indra*, thus equating this sort of *bala* with *Indra* and androgenicity. Therefore, even the word bald is possibly related to *Indra*. *Kalata* means possessing baldheadedness. Since *kala* is semen virile (with *ta* indicating state of having), *kalata* is another link between baldness and androgenicity known to the ancient Indians

The modern era of endocrinology started in 1905 with the word hormone coined by Starling and that of sex-hormone studies with the isolation of oestrone from urine of pregnant women independently by Butenandt and Doisy in 1929.^[15, 16] Hamilton suggested role of endocrine and genetic factors in male baldness.^[17] Yet, it is apparent that androgenicity related *Indralupta* was recognised as a specific type of baldness by *Āyurvēda* more than two millennia ago. Genetic relationship of certain types of baldness could have been identified by keen observation of familial incidences over the years without the concept of any hormone like substances in the body. But, the naming of the condition and the identification of pregaurin as local treatment implies that *Āyurvēdics* had the concept that: (i). A virilising substance in the body caused the hair loss, (ii) pregnant females had antagonists to this which are excreted through urine and (iii) local application of these would be effective in antagonising the virilising one.

At present, the basis of treatment for AGA is prevention of formation of dihydrotestosterone, the potent agonist of androgen receptors, which mediates hair loss. At present, no hormonal treatments is approved in males; but cyproterone acetate, an androgen receptor blocker, has been used in females.^[18] It has been suggested that oestrogens may inhibit the peripheral action of androgens.^[19] Topical oestrogens may benefit by their anti-androgenic activity as well as direct action on hair follicle estrogen receptors.^[20] Presence of oestrous hormones in pregaurin was reported in 1929 by Hisaw and Meyer.^[21] Kruthika et. al.

reports that pregaurin shortens the attainment of puberty and ovarian folliculogenesis in female rats, suggesting sex hormone action.^[22] All these suggest the potential benefit of pregaurin in AGA, as per modern medical knowledge too.

One question would be as to where and when the use of pregaurin was conceptualised in India. *Rasaśāstra* (iatrochemistry), dealing with various medicinal products, was fairly advanced in Kēraḷa since long. *Rasavaiśeṣikasūtra* (100-600), *Tantrayuktivicāra* (700s), *Hṛdaya* (1100s), *Hṛdayabodhika* commentary on *Aṣṭāṅgahṛdaya* (1300s) and various unnamed interpretational treatises in the late 1200s had been written by Keralites, in Sanskrit, stand evidence to this.^[23] None of them had advised the use of urine for *Indralupta* nor mentioned black cow urine.

As regards the practice outside Kēraḷa, the ancient treatises of *Caraka* and *Vāgbhaṭa* prescribe application of various medicinal plant pastes, but not urine, for treatment of *Indralupta*.^[24, 25] Neither of the above, nor *Govinda Bhagavatpāda's Rasahṛdayatantra*, an acclaimed iatrochemical work of the 1000s nor *Nityanātha's Rasaratnākara*, an important work on iatrochemistry written in 1300s, even mentions pregnant animal urine.

The *Bhāvaprakaśa Nighaṇṭu* of *Bhāvamishra*, of mid-1300s notes that the milk of cows of different colours such as black, red, white and yellow have different properties but does not note any such relationship in the case of urine, nor is there any mention of pregnancy.^[26] The *Madanapālanighaṇṭu*, 1347 AD, comments that milk of *kṛṣṇa gau* (black cow) is superior, but again there is no mention of urine.^[27] It is to be noted that in these treatises, *kṛṣṇa gau* apparently meant a cow with black coloured skin, though not stated as such, and no reason is given why the colour should affect milk quality. But, Nadkarni has categorically stated that properties of milk vary with *skin colour* of the cow, but urine finds no such mention.^[28] Moreover, the Sanskrit word *kṛṣṇa* cannot be construed as pregnancy in any way.

Rasaratnasamuccaya (RRS), one of the most important books on iatrochemistry is the first work outside Kēraḷa to advise black cow urine for treatment of *Indralupta* and to make the hair strong.^[29, 30] Here too,

black is usually taken as skin colour. But, the dating of this book is controversial, with suggestions ranging from 13-15 century; moreover there are multiple versions of it.^[22]

Modern *Āyurvēdic* books like those by Dash, Rao, etc., and the *Āyurvēdic* Pharmacopoeia of India identify urine as part of the *Ayurvedic* armamentarium, but do not mention any relationship with skin colour or pregnancy.^[31, 32, 33]

From the above, it can be seen that *none* of the treatises in Sanskrit, including the *Samhitās*, whether written in Kēraḷa or not, *before* the ascribed date of the *Maṇipravāḷam* poems mentions use of any pregnant animal urine. Some compositions *after* the *Maṇipravāḷam* date do mention a relation between colour and milk, but not urine. The RRS, and those written based on it, does mention use of black cow urine, the black apparently indicating skin colour since the word *kṛṣṇa* does not connote pregnancy in any way. Moreover, it is probable that the RRS is later to the *Maṇipravāḷam* verses. All these indicate that the use of pregaurin for *Indralupta* evolved in Kēraḷa where *Āyurvēda* advanced independently. Abundance of *Āyurvēdic* literature even before the *Maṇipravāḷam* period suggests that Kēraḷa physicians had the background information to develop this concept. This knowledge percolated to other parts of India but not in a fully developed way resulting in just the mention of ‘black cow urine’ without any understanding as to its true significance. The same happened in Kēraḷa too, the real meanings being masked in intricate semantics and the overshadowing of *Āyurvēda* by Modern medicine following the arrival of Europeans. Another obvious cause is that the reason why this disease was named *Indralupta/ Vāsavaliptanoy*, i.e. the link with male hormones, was also forgotten along with the knowledge that pregnant females have antagonists to them. In such a scenario, the semantic importance of disease and drug names also will naturally be forgotten. The commonly held belief that products from a black cow are better is a vestige of that forgotten superior knowledge.

As regards the use of urine in traditional medical systems of other countries, a report in Nature shows that medieval Chinese had used sublimates from human urine to prepare drugs for treatment of various conditions including impotence.^[34] There is no mention of any pregnant female urine, nor use of urine in

baldness.

Therapeutic use of urine is an anathema to modern medicine with one exception: the use of estrogens isolated from urine of pregnant women (Emmenin and Progynon) and pregnant mare urine (Premarin) orally as well as topically. It should be considered remarkable that *Āyurvēda* could propose use of such a medication so far back in time, much before modern medicine thought of it.

Summary and Conclusion

Detailed semantic analysis of the name of the disease in Sanskrit as well as that of a medicine used for the treatment of androgenic alopecia described in two *Maṇipravāḷam* medical verses was done. It is evident from the analysis of the names (*Indralupta* and *Vāsavaliptanōy*) that *Āyurvēda* had identified the condition as being due to activity of masculine factors, i.e. androgenicity. The selection of urine from pregnant cow for its treatment makes this more certain, and also underscores the fact that *Āyurvēda* knew about feminising factors, which are antagonistic to the masculine, being present in pregnancy and secreted in urine. The study suggests that, though not described as such anywhere, *Āyurvēda* does have the concept of hormones. It is possible that words equivalent to hormone may be present, though hidden, in *Āyurvēdic* lexicon and hopefully be revealed by semantic analysis.

The present paper is the first one based on the results from an on-going project on *Maṇipravāḷam* medical verses using semantic analysis of pertinent lexical items as the method of research aimed at identifying any system of nomenclature of organs, diseases, drugs, etc., the link between these and areas where principles of *Āyurvēda* correlate with those of Modern medicine. The methodology used could convincingly show that in the specific area studied, namely treatment of androgenic alopecia with pregaurine, the disease and drug names reflected the nature of the disease, were interlinked and on par with modern concepts, as could

be made out by semantic analysis, thereby validating the objectives of the project. It is concluded that the method of semantic analysis used here is feasible, worth continuing and hopefully will yield more areas of congruence between Ayurveda and Modern Medicine as more verses are studied.

Conflicts of interest

There are no conflicts of interest

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End Note: The verses studied

1. The Yōgāmṛtam verse

Ādikkōrttindraluptattinu kimapi

Jaḷūkikka chukkin kiḷibhi-

Ssādhippū kācci mātu:kaḷal kaḷukiya nīr-

Koṅṭu dhārānca cheyka

2. The Ālattūr verse

kaṛutta gōmūtra supiṣṭamādarāl

prasūnamālipyaca ceparattijam

suvanāsamghṛṣṭa kutārarakṭasruta-

yedvaarā vāsavaliptanōypiṇam