"An Observational Study on Upadrava of Atisthoulya (Complications of Obesity)"

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Abstract

Ayurveda, the ancient Indian system of Medicine, science of life, emphasizes on maintenance of positive health in healthy individuals and alleviation of ailments of diseased one. Acharya Charaka has explained various features of prashashta purusha which is one among the features of healthy individual. Deviation from the features is considered as the nindita pursha i.e forbidden people in the society. Atisthoulya being one among the ashta nindita, is characterized by medomamsa vriddhi, chala sphik, chala udara, chala sthana and ayatopachayaotsaha. In order to cure the disease of the diseased one, it is very crucial to understand the stage of disease. Upadrava is the secondary change produced in a disease, indicates the progress of the disease condition. Ignorance of them in the treatment can further harm the patient. Atisthoulya being a difficult one to manage compared to karshya depicts upadrava like prameha pidaka, vatavikara, kushta, visarpa, meha, kamala, etc. which have been mentioned by our acharyas. In contemporary science the complications of obesity are type II diabetes mellitus, hyperlipidemia, diabetic complications, stroke, non-alcoholic steatohepatitis, cirrhosis, exertional dyspnea, sleep apnea, respiratory failure, osteoarthritis, varicose veins etc. Thus, an attempt has been done to understand the occurrence of Upadrava in Atisthoulya conditions for which observational study was carried out among 100 patients and data was collected.

Result: Among the 14 Upadrava of Atisthoulya mentioned in the Ayurveda classics, 11 were present in the subjects, of which Dhatukshayajanya vatavyadhi being the most prevalent one and Jwara being the least prevalent one.

Key words: Upadrava, Atisthoulya, Vatavikara, Prameha, Kushta.

Introduction

Equilibrium of dosha, agni, dhatu, mala in terms of quantity and its function accompanied by the pleasantness of indriya and manas is the definition of health in our science.¹ Dhatu plays a vital role in the maintenance of health. Dhatwaagni has a crucial role to play in the maintenance of normalcy of Dhatu. Deviation of Dhatwaagni from its normal function leads to Dhatwaagni maandya leading to improper formation of Dhatu. one among the dhatwaagnimandyaajanya vikara is atisthoulya where the presence of ativriddhi of meda dhatu is seen.²
Atishthoulya is a bahudaushaavsta, [3] caused due to santarapanotha aahara [4]. It is a kaphaja nanaathmaja [5] dhatwagnimanduyajanya vikara. Cardinal features of Atishthoulya are medomamsa ativruddhi, chalasphik, chalodara, chalastana, ayathoapachaya and anutsaha. [6] Along with these features, Charaka mentions 8 morbid conditions coined as Ashtadosha i.e., aayushohrasha, jawavarodha, kkrhavyavaayatha, dourbalya, dourgandhnya, swedabadha, kshudaaatmaatra, pipasaatmaatra [7] which manifests in later stage of disease due to its chronicity. It manifests due to various causative factors like avyayaama, divaswapna, shleshmala aahara. [8] Acharya Charaka mentioned harsha nitya, achintana and beeja swabhavana [9] as the additional causative factor for Atishthoulya. Due to the above mentioned causative factors, there will be formation of madhur aahara rasa which is predominant with sneha guna leads to ativriddhi of meda dhatu. Due to ativriddhi of meda dhatu, marga gets obstructed with medas leading to improper nourishment of other dhatu. [10] Due medasaavruta marga, vaayu gets restricted in the kotha, and its constant movement within kotha leads to sandhookshana of agni and will result in rapid shoshana of aahara. This will lead to rapid digestion of the aahara, further enhancing the craving for food. If the craving is not met on time, the person will be inflicted with severe disorders. [11] Thus, the involvement of medodhatwaagni in the manifestation of Atishthoulya plays a vital role.

Due to the similarity in the etiology, pathogenesis and the clinical manifestations Atishthoulya is analogous to Obesity where the dhatwaagni maandya understood as metabolic error in a parallel perspective. Obesity is the excessive or abnormal accumulation of adipose tissue in the body that impairs health via its association to the risk of development of diabetes mellitus, cardiovascular disease, hypertension and hyperlipidemia. [12] It is a significant public health epidemic which has progressively worsened over the past 50 years. It is a complex disease with multifactorial etiology. It is the second most common cause of preventable death after smoking. Various metabolic changes occurring due to the excess accumulation of adipose tissue consequently lead to complications. Thus, it has adverse effects on both mortality and morbidity. Type II diabetes mellitus, Hyperlipidemia, Diabetic Complications, Stroke, Non-Alcoholic Steatohepatitis, Cirrhosis, Exertional Dyspnea, Sleep Apnea, Respiratory Failure, Osteoarthritis, Varicose Veins are some of the major complications of Obesity. [13]

Upadrava is a disease produced after the formation of the main disease, and irrespective of its chronicity, it is dependent on the main disease. [14] It is produced by the same dosha which is responsible for the manifestation of main disease. [15] Acharyas have mentioned various terms like upasargika, anubandha, anugaaam [16]. It manifests during the bheda avastha of kriya kala [17] making it difficult in the management due to the chronicity of vyadhi.

Acharyas have enlisted various Upadrava like Prameha Pidaka, Jwara, Bhagandhara, Vidradhi, Vata vikara, Kushtha, Visarpa, Atisaara, Meha, Arsha, Sleepada, Aaapachi, Anu Jantu. [18] Acharya Charaka opines that involvement of morbid Agni and Vaayu in the pathogenesis of the disease leads to Upadrava further causing morbidity and mortality which is pictured with the help of simile of forest fire destroying the forest. [19] The culprit for the severity of the condition is Margavarana occurring in the Samprapti of Atishthoulya. Medasaavruta marga in the shareera leads to manifestation of various Upadrava based on the susceptibility of Srotas. Shhoulya being a difficult one to manage compared to karshya, understanding Upadrava of Atishthoulya is a need of the hour pertaining to Diagnosis, Prognosis and Treatment. Thus, an attempt to understand the upadrava of atishthoulya had carried out.

**Aim**

To evaluate Upadrava of Atishthoulya.

**Objective**

- To prepare the questionnaire for the assessment of upadrava of Atishthoulya
- Critical study of Atishthoulya Upadrava with possible correlation with obesity complications
RESEARCH METHODOLOGY

METHODOLOGY

STUDY DESIGN

This was a cross-sectional survey study. The study consisted of a conceptual and an observational aspect. In the conceptual aspect relevant literature about the concept of Upadrava, Atishthoulya, Upadrava of Atishthoulya, understanding of each upadrava was collected, conceptualized and analyzed from ayurvedic perspective. Case proforma was prepared which included the demographic data, detailed history pertaining to Atishthoulya, Dashavidha Pareeksha, Asthasthnaana Pareeksha, various examinations of the patients. Questionnaire comprising of both closed and open-ended questions related to each upadrava with its clinical symptoms were prepared and validated. In the observational aspect, upadrava of atishthoulya was assessed in 100 patients who fulfil the inclusion criteria with the help case proforma and questionnaire. Data collected was classified, interpreted and analysed to draw conclusion.

PROCEDURE OF COLLECTION OF DATA

As per the study protocol approved by the Institutional Ethical Committee, written informed consent was obtained from all the study participants. Participants were made to respond to the questionnaire in the closed Interview method.

SAMPLE SOURCE

Patient attending OPD & IPD of Alva’s Ayurveda medical college and hospital, Vidyagiri and other referrals. Other referrals included for the study Patients attending OPD & IPD of Alva’s College of Naturopathy & Yogic Sciences, Mijar. Based on the inclusion & exclusion criteria, 100 diagnosed cases of Obesity were selected among patients aged between 19 to 70 years.

INCLUSION CRETERIA

(a) Patient fulfilling the diagnostic criteria.
(b) Patient were selected irrespective of gender.
(c) Patient between 19 to 70 years of age.

EXCLUSION CRETERIA

(a) Patient having obesity as Complication of other diseases.
(b) Patient who is under long term steroid medications.
(c) Patient suffering from other endocrinal diseases.
(d) Pregnant and lactating women.

DIAGNOSTIC CRITERIA:

(a) BMI – subject with BMI above 30kg/m$^2$ [24][25]
(b) Waist circumference: Male > 90 cm
                Female > 80cm
(c) Waist to hip ratio: Male > 1.0
                Female > 0.8
(d) Based on the clinical features of Atishthoulya mentioned the classics[26]
(e) Upadravas of Atishthoulya are [27][28]

- Prameha pidaka
- Jwara
- Bhagandhara
- Vidradhi
- Vata vikara
- Kushta
- Visarpa
- Atisara
- Meha
Patient having features of Atishoulya and any of the above Upadrava.

ASSESSMENT CRITERIA

Based on following Upadrava of Atishoulya assessment is carried out

- Prameha pidaka
- Jwara
- Bhagandhara
- Vidradhi
- Vata vikara
- Kushta
- Visarpa
- Atisara
- Meha
- Arshas
- Sleepada
- Apachi
- Kamala
- Anu jantu

OBSERVATIONS

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Graph No.18. Distribution of patients based on incidence of *Jwara*

Graph No.19. Distribution of patients based on incidence of *Atisara*
RESULTS AND DISCUSSION

Discussion on demographic data:

Age: Among 100 patients, 25% were belonging to the age group of 20-30 years. As the study was conducted on wide range of age group, the above observation was recorded.

Gender: Among 100 patients, 54% were male which is more compared to female. As per statistical data, Females are more prone to obesity compared to male.

Religion: Among 100 patients, 75% belonged to Hindu community. This is because of study population which is predominant of Hindu community. As per the statistical data there is no particular religion, race or caste which leads to obesity.

Occupation: Among 100 patients, 26% were housewives. They are habitual of eating while cooking and providing company to their family members, guests. Due imbalance in the energy intake and expenditure, lead to manifestation of the disease.

Marital Status: Among 100 patients, 66% were married. Incidence is high in married may be due to change in food habits, pregnancy, psychological factors.

Educational Status: Among 100 patients, 33% were graduates. Researchers have reported that there is direct relationship between increase in obesity with the number of years of education in lower income countries.[29]

Socio-Economical Status: Among 100 patients, 61% belonged to middle class, which is due to the study population is predominant of middle class.

Locality: In the present study, obesity was more prevalent in urban area compared to rural area. Obesity prevalence in urban population is attributed to the increase in the available resources to be spent on the food and leisure time activities, lot of sophistication leads to sedentary life style causes obesity.[30]

Discussion on Familial History: In the present study, it is observed that majority of the obese individuals has positive family history which indicates the role of genetic factors leading to obesity. Beeja swabhava is one among important nidana leading to ati sthoulya.[31]

Discussion on Work Pattern: Among 100 patients, 60% were having sedentary work pattern. Most of the study subjects were doing desk job. Desk jobs are the work were people are working for long in sitting.Asya Sukha leads to Sthoulya.[32]

Discussion on Prakriti: 61% of the current study were belonging to kapha pradhana prakrithi. Atisthoulya is kapha nanathmaja vikara and has predominantly seen in kapha prakrithi.[33]

Discussion on Class of Obesity: Out of 100 patients of atisthoulya, 62 patients belong to Class I obesity. Body Mass Index is measured using the weight of the individual in Kg and the square of the height in meters, where Class I Obesity ranges from 30-34.99kg/m², Class II ranges from 35-39.99kg/m² and Class III Obesity is above 40kg/m².[34]

Discussion on Upadrava of Atisthoulya:

1. Prameha: In the present study, 26% showed the symptoms of prameha as upadrava of atisthoulya. Prolonged untreated atisthoulya condition with continuity of nidana sevana leads strengthening of the vyadhi. Due to medasavruta marga, there won’t be poshana of other dhatus[35] leading to formation of aparipakwa dosha and dhatu. Due to the continuous consumption of santarpanotha aahara, vulnerability of aparipakwa dosha, along with abaddha medas, promotes the upathi of prameha based on the vikaravighaatha bhava abhava. While mentioning of the nidana susceptibility towards the disease, Atisthoulya is mentioned[36]

Imbalance in energy intake and expenditure lead to the accumulation of adipose tissues mainly white adipose tissues, which lowers the production of adiponectin leading to impairment in the glucose uptake from muscles further leading to Insulin Resistance. It causes Type II Diabetes Mellitus in obese individuals.[37]

2. Prameha Pidaka: In the current study, 13% were presented with prameha pidaka as upadrava of atisthoulya. In Atisthoulya, there is upathi of ama rasa dhatu[38] which leads to upathi mamsa dhatu which is in aparipakwa avastha. Due to the saamyata of nidana, dosha and dooshya in atisthoulya and prameha pidaka, bahudrava shleshma and abaddha medas affects the aparipakwa mamsa dhatu, leading to shaitilyatha of mamsa causing prameha pidaka,[39]
3. Vatavikara:

3.1 Medasaavruta Vatavikara:

a. Medasaavruta Pakshaaghata: 8% were diagnosed with medasaavrutha vata as Upadrava of Atishthoulya. Here the lakshana of margavaarana janya pakshaaghata were assessed. Atishthoulya is a santharpanothe vikara which leads in the formation of abaddha medas due to dhatwaagni maayda. Due the medasaavrutha marga, anya dhatu doesn’t get poshana which leads to kshaya of dhatu. Asthi dhatu has ashrayaa ashrayi bhava with vata\(^{[40]}\) where kshaya of asthi dhatu will cause vridhdi of vata dosha. Vata which is in prakopavastha gets avrutha by the abaddha medas in rasa rakta marga which obstructs the vata gati leading to manifestation of avaranajanya pakshaghata.

Dyslipidemia is commonly seen in patients of obesity where there will be increased levels of LDL cholesterol, increased abnormal lipoprotein and decreased level of HDL cholesterol which promotes the atherosclerosis by various mechanism like increase blood pressure, increased glucose level, systemic inflammation leading to ischemic stroke.\(^{[41]}\)

b. Vatarakta: In the study, 23% had vatarakta lakshanas as upadrava of atishthoulya. Vata rakta is an avarana vikara, where rakta does avarana of the vata dosha in the raktavaha srotas. Morbid kapha and medas involved in manifestation of atishthoulya promotes the avarana. Rakta along with these does avarana of vata leading to vatarakta in atishthoulya condition. Sthoulya is one of the nidana for the manifestation of vatarakta.\(^{[42]}\)

3.2 Dhatukshayajnaya Vatavikara:

a. Sandhivata: 64% patients of atishthoulya had symptoms of sandhivata. Sandhivata is vyadhi which occurs due to the prakopavastha of vata dosha in the shareera. The cause for the vata prakopa is dhatu kshaya which is evident in the patients of atishthoulya. Due to the ama anna rasa formed due to the atishthoulya nidana, does atipoorana meda dhatu, thereby, the upcoming asthi dhatu gets kshaya.\(^{[43]}\) This leads vridhdi of the vata in shareera and due to kha vaigunaya in the sandhi, gets lodged in it causing sandhi vata.

In obese individual, due to increased mechanical pressure on weight bearing joints and increase in the pro inflammatory interleukin’s due accumulation of adipose tissue lead to osteoarthritis.\(^{[44]}\)

b. Samanya Vata vyadhi Lakshana: 77% were suffering from samanya vata vyadhi lakshanas. In Atishthoulya, due to the samprapthi, vata prakopa is predominantly seen which on getting lodged in various sthewan of shareera develops various samanya lakshanas of vata vyadhi like spandana, gatra suptata, kati graha, anidratha etc based on kha vaigunya.

4. Bhagandhara: In the current study, there were no patients with bhagandhara as upadrava of atishthoulya.

5. Arshas: 15% were having Arshas as upadrava of Atishthoulya. Nidana of Arshas speaks about the intake of guru, Madhura, sheetha, abhishyandi ahara, consumption of dadhi, pishitha and following certain like divaswapna, sukha shayana, asana and sthawan will lead to impaired agni and mala sanchaya.\(^{[45]}\) Atishthoulya individuals are prone to such nidana and due to prabhootta vaayu in koshta\(^{[46]}\), there will apana dusthi. These contributes for manifestation of arshas in atishthoulya.

6. Vidradhi: 25% patients in the study had encountered vidradhi as upadrava of atishthoulya. In vidradhi, there is dusti of twak, mamsa, meda, asthi, snayu, asrk, kandara.\(^{[47]}\) Dosha, dhatu, upadhatu in ati sthoulya patients are improperly formed and are in the vitiated state. This favors the dusthi of the dooshya involved in the manifestation vidradhi and based on the kha vaigunya, upathi of vidradhi occurs on various parts of shareera as upadrava.

Obesity results in deficiencies of the human self-tolerance mechanisms by promoting pro inflammatory processes which causes systemic immune impairment, which facilitates the various infections. Abscess majorly caused due to staphylococcus aureus can infect the obese individual due to the impairment of immunity.\(^{[48]}\)

7. Kushtha: 63% patients had lakshanas of kushta as upadrava of atishthoulya. In the present study, the patients were assessed based on the definition of kushta which refers to deformity and discoloration of skin \(^{[49]}\). Kushtha involves saptha dravya sagraha which includes tridosha, twak, mamsa, shonitha and lasika.\(^{[50]}\) In patients of atishthoulya, there will be vitiation of tridosha and asamyak dhathu upathi. As per dhatu poshana krana, each dhatu gets poshana from its prior dhatu and later does poshana of its upadhatu. Thus, there will
be upadraha of aparipakwa upadhatu in atishhoullya. Presence of the dosha dhooshyas involved in the manifestation of kushtha can be seen in atishhoullya. Due to the similarity in the nidana and vulnerability of the dhooshyas makes it easy for the manifestation of kushtha as upadraha of atishhoullya.

Altered epidermal barrier, thickened layer of subcutaneous fat, impaired lymphatic flow in the subcutaneous tissues and increased pro inflammatory cells in obesity leads to various skin manifestations.[51]

8. **Visarpa**: 9% patients had visarpa as upadraha of atishhoullya. Visarpa is a vyadhī manifesting due to saptha dravya with predominance of pitha dosha and rakta dhātu.[52] Due to vitiation of tridoshas and dhatus in atishhoullya patients, along with the consumption of snigdha, drava ahara further vitiates the rakta dhātu will make body susceptible for manifestation of visarpa in the atishhoullya patients.

Obesity stresses the delicate lymphatic vessels and serves as significant risk factor for lymphedema which on untreated state further lead to tissue breakdown, limited motion and development of cellulitis. Immunosuppressed state of the obesity promotes the entry of pathogen to the body worsening the condition in obesity.[53]

9. **Kamala**:

5% patients were found to have kamala as upadraha of atishhoullya. Here the patients diagnosed with non-alcoholic fatty liver disease were included in the study. Due to calorie over load and ectopic accumulation of triglycerides in liver leads to non-alcoholic fatty liver disease in obesity patients.[54]

10. **Apachi**:

Apachi was not seen in any of the atishhoullya patients as a upadraha.

11. **Sleepada**:

In the current study, sleepada was not observed as the upadraha of atishhoullya.

12. **Anu jantu**:

51% patients were having anu jantu as the upadraha of atishhoullya. Anu jantu is refered as krimi manifesting due to medas and sweda dourgandhya.[55] Recurrent attacks of anu jantu were noted and documented in the patients of atishtoullya. Swedadiyā is one of the lakshanas of atishhoullya.[56] From the abaddha medas present in atishhoullya condition, there will be upathī in sweda which is vikṛutha and will be increased quantitatively. This enables the upathī of krimi in places where there is swedadiyā leading anu jantu.

Increase in the accumulation of adipose tissues leads to increase in the release of pro inflammatory interleukins, altering the immune system of the patients with obesity. Due accumulation of adipose tissue, core body temperature will be raised in order to maintain the body temperature, body will sweat. Due to increase sweating and altered immune system in obesity, fungal infections tend to develop in obese individuals.[57]

13. **Jwara**: 2% had jwara as upadraha of atishhoullya. Here the patients were enquired about the recurrent attacks of fever. Atishhoullya is a rasa nimitha jaja vikara where asamyak rasa upathī which leads to the formation of asamyak dhātu. Deranged agni, rasa, sweda will be present in atishhoullya condition leads jwara in atishhoullya.

14. **Atisara**: 14% patients were diagnosed with atisara as upadraha of atishhoullya. In atishhoullya, due to aarutha vata in koshta and deranged agni, atisara develops in atishhoullya as upadraha.[59] Studies suggests that there is higher prevalence of diarrhea associated with obesity which is due to changes in bile acids resulting in bile acid diarrhea, accelerated colonic transit, increased mucosal permeability.[60]

**CONCLUSION**

- Atishhoullya is a santharpanotha, dhatwaagni maandjavajana,kaphaja nanaathamaja vikara caused due to morbid medas.
- Upadraha which manifest after the genesis of the main disease can be single or multiple based on the severity of the disease.
- Among the 14 Atishhoullya Upadraha mentioned in our classics, 11 were encountered in the study. Encountered Upadraha of Atishhoullya are Prameha, Prameha Pidaka, Margavaranajaya Pakshaaghata, Vataaraka, Sandhi Vata, Samanya Vata Vyadhī Lakshana,Arshas, Vidradhi, Kushta, Visarpa, Kamala, Anu Jantu, Jwara, Atisara.
Most prevalent upadrava in the present study population was vata vikara, predominantly the dhathu kshayajanya vata vikara.

Upadrava can be classified as sthoola and anu based on its severity of the manifestation of disease.

Sthoola upadrava are medasavruta pakshaaghata, prameha, visarpa.

Anu upadrava are prameha pidaka, kushta, vidradhi, vata rakta, sandhivata, samanya vata vyadhi lakshanas, arshas, anu jantu, atisara, kamala and jwara.

Sarvadaihika upadrava are pakshaaghata, prameha, vata vikara, kamala, kushta, visarpa, jwara, atisara whereas sthanika upadrava are vatarakta, arshas, anujantu, prameha pidaka.

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