Anaemia is an extremely prevalent condition common in all human of all ages, living in all condition and continents. It has got serious consequences for both the human health as well as the socioeconomic status of the country. Globally, 50% of anemia is attributable to iron deficiency and accounts for approximately 841,000 deaths annually worldwide. According to Ayurveda as well as in modern system of medicine has accepted that Aharaja nidan (diet & regimen) and Viharaja (lifestyle factors) are plays an important role in pathogenesis of Pandu (anaemia). The aim of the study was to identify those factors among the age group 10 to 60 years and to create the awareness to the community in the future. A cross sectional survey study was conducted in 120 patients of Pandu attending the OPD & IPD of Shyamadas Vaidya shastra pith hospital in Kolkata West Bengal, irrespective of their sex, religions & economic status through collecting data by questionnaires and they have been observed on dietary, physical, and psychological factors. The obtaining data revealed that especially female participants, rural as well as urban people, people from low & middle economic status were suffering from Pandu due to inadequate, improper intake of Aharaja & Viraja nidan. After evaluation of these factors, it can be concluded that, Aharaja & Viharaja nidan had been justified in the pathogenesis of Pandu which was depicted in different Ayurvedic compendium & about the scenario of Nidan in this particular population were suffering from Pandu.

KEYWORDS: Aharaja nidan, Viharaja nidan, Pandu, Anaemia.

INTRODUCTION

Anaemia is defined as a clinical condition characterized by reduction of haemoglobin concentration of blood below the normal according to the age, sex, physiological condition and altitude above sea level of that person[1]. The word Pandu denotes the development of Pandu (pale-yellow) Haridra (yellowish) & Harita (green) discoloration of the skin or relates to the loss of Prakriti varna of the body and relates to a symptom as well as diseases with the name of Pandu[2]. Clinically anaemia can be seen in lips, tongue, palate, nail beds and skin. According to Ayurveda Ababhasini layer resembles the outer most layer of skin and believed to reflect the health of healthy individual[3].

Anaemia is the most common nutritional disorder worldwide. Globally, 50% of anemia is attributable to iron deficiency and accounts for approximately 841,000 deaths annually worldwide. In India adolescence (10-19 yrs) group are more prone for anaemia. The essential prevalence of generalized Pandu (anaemia) in developing countries are 42% in women (15-59), 305 in male (15-59), 45% in adult (>60%). As per NFHS (National Family Health Survey) 3 survey (2005-2006), 70% of children are anemic and 3% are severe anemic[4].

Anaemia can be caused by the innumerable factors, the most common factors being deficiency of essential elements for the haemoglobin, blood loss (blood loss during menstrual cycle in female), repeated pregnancies in reproductive age, worm manifestation, haemolysis due to known and unknown causes, bone marrow condition causing suppression of red cell synthesis and the other causative factors are intake of improper nutritious diet, below poverty level, improper hand hygiene[5]. According to Ayurveda it is not restricted up to blood and blood forming haemopoetic system, it is caused due to the non-sequences of transformation of food into proper body components like Rasa, Rakta up to Shukra. Pandu is the diseases of Rasavaha srutodusti[6]. It mainly caused due to the Dhatukshayaja (reduction of Dhatu), Grahani dosa (impaired
digestive system) & Krimiroga (worm manifestation). Pandu is also a Santarpnaja & Apatarpanaja vyadh. In the pathogenesis of Pandu pitta (Pachak, Ranjak, Bhrajaka & Alochak) & Vata (Saman, Vya) are the main Dosha and Twak, Rakta, Mamsa & Meda are the Dusyas. This aggravation of Pitta brings about the diminution of the specific portion of Rasa responsible for the nourishment of Raktā as a result of which there is no production of nutrients factor to nourish the Rakta (haemoglobin fraction of blood). Similarly, Tejas is considered to be original source of both Pitta as well as complexion (Vārṇa)7]. Apart from the above said causative factors compendium also described the Nidana (causative factors) i.e., Samanya nidan-general and Vishesha (specific) Nidan for the development of Pandu. Aharaja nidan (dietetic factors), Viharaja nidan (improper daily regimen) & Manasik nidana (psychological factors) are included under these Samanya or Vishesha nidan. Atityayam (excessive exercise), Atilavan & Atiamla (excessive use of salt and sour), Ati madya (daily intake of large amount of alcohol), Ati divaswapna (intake of excessive sleep in day times), Attikshna (consumption of very spicy food), Usnaati sevan (excessive use of very hot substances), Viruddha, vidagdha & Asatmya bhojan, Ritu vaisamyat, Vegadharan, Pratikarma vaisamyat, Kama (excessive desire of sex), Krodh (anger), Chinta (worrying in excess), Bhaya (fear), Shoka (grief) are the Aharaja and Viharaja nidana8].

Therefore, this study was carried out with the following aims and objectives to study the significance of Pandu through studying Aharaja and Viharaja nidana & to evaluated the role of Aharaja and Viharaja nidan in the pathogenesis of Pandu.

MATERIAL AND METHODS

Selection of subjects

Patients were selected as known anaemia from the OPD &IPD of the institution of the post graduate Ayurvedic Education and Research at Shyamadas Vaidya Shastra Pith hospital, Kolkata, West Bengal, according to the haemoglobin level. The subjective criteria were assessed on those patients & objective criteria of haemoglobin, & serum ferritine have been assessed on those patients to establish the disease Pandu. Consent of each patient was taken. At the time of history taking Aharaja & Viharaja nidana were asked to the patients in details through questionnaires.

Sample size and sample design

A cross-sectional survey study was carried out after randomly selection followed by registration of 120 patients of Pandu. They were observed on basis of dietary, physical, and psychological factors.

Inclusion Criteria

Subjects of either sex between 10-60 years having decreased level of blood haemoglobin, and serum ferritine as objectives criteria and having the subjective criteria according to Pandu were selected for the study.

RESULTS AND OBSERVATIONS

Table 1: Shows the distribution of Aharaja nidana of 120 patients of Pandu

| S.No. | Different Aharaja Nidan                                      | No. of patients | Percentage (%) |
|-------|-------------------------------------------------------------|-----------------|----------------|
| 1     | Ati amla sevan (excessive intake of sour)                   | 102             | 85.00          |
| 2     | Ati lavan sevan (excessive intake of salt)                  | 106             | 85.00          |
| 3     | Atiteekshna Ahara sevan (excessive intake of spicy food)    | 80              | 66.66          |
| 4     | Ati madya seven (excessive consumption of alcohol)         | 30              | 25.00          |
| 5     | Atiusna (intake of excessive hot substances)               | 88              | 73.33          |
| 6     | Viruddha bhojana (intake of incompatible food)             | 100             | 83.33          |
| 7     | Asatmya bhojan (which is not suitable for individuals)     | 00              | 00.00          |
| 8     | Vidagdha bhojan (intake of fried food)                     | 56              | 46.66          |
| 9     | Mridbhakshan (consumption of mud or pica)                  | 04              | 03.33          |
| 10    | Consumption of Nispava, Masa (types of legumes)            | 10              | 08.33          |
| 11    | Pinyaka (Oil cake)                                         | 34              | 28.33          |
Graph 1: The distribution of Aharaja nidana of 120 patients of Pandu

Table 2: The distribution of Viharaja nidana of 120 patients of Pandu

| Sl no. | Different Viharaja Nidan                              | No. of patients | Percentage (%) |
|-------|-------------------------------------------------------|-----------------|----------------|
| 1     | Ativyayam (excessive exercise)                        | 58              | 48.00          |
| 2     | Ati vyavaya (frequent sexual intercourse even before the food is not properly digested) | 26              | 22.00          |
| 3     | Divaswpana (sleeping during day time)                 | 118             | 98.00          |
| 4     | Vega vidharanat (suppression of natural urges-Chardhi) | 16              | 13.00          |
| 5     | Ritu vaisamya (transgression of prescribed seasonal regimens) | 104             | 87.00          |
| 6     | Pratikarma (improper administration of Panchakarma)   | 00              | 00             |

Graph 2: The distribution of Viharaja nidana of 120 patients of Pandu

Table 3: The distribution of Manasika nidana of 120 patients of Pandu

| Sl no. | Different Manasik Nidan | No. of patients | Percentage (%) |
|-------|-------------------------|-----------------|----------------|
| 1     | Krodh (anger)           | 100             | 83.33          |
| 2     | Chinta (excessive thought) | 98             | 81.66          |
| 3     | Bhaya (fear)            | 34              | 28.33          |
| 4     | Shoka (grief)           | 10              | 8.33           |

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DISCUSSION

This study showed that the evidence of 85% value of two Aharaja nidan i.e., Atiamla & Ati lavan sevanam (excessive consumption of sour and salt content foods); next 83% were used to take Viruddha bhojana (incompatible food); next 73% and 66% were used to take Ati usna (excessive hot) and Atitikshna ahara sevan (repeated intake of spicy food). Among the 120 patients 46% had the habit of Vidagdha or fried food. In case of Viharaja nidana 98% of the patients having habits of Divaswapna (sleeping during day tie); 87% were not maintaining the dietetic and lifestyle according to the Ritu (season); Ativyayam (excessive exercise) had done by 48% of the patients. Today each and every people has suffering from mental stress. Two psychological factors i.e., Krodh (anger) & Chinta (excessive thought) play most important role for the production of any disease. Here 83.33% and 81.66% patients having Krodh and Chinta. Samprapti of Pandu roga divided into two-way Santaranaja & Aptaranaja Pandu. According to Acharya Charaka samprapti (pathogenesis) of Pandu has been described in simplified manner through schematic diagram.
So, the above-mentioned data in table 1, table 2 & table 3 reveals that the maximum number of patients had ingested Aharaja, Viharaja & Mansak nidana as described in Charak Samhita which favors the manifestation of Pandu & these can be interpreted as follows.

**Ati amla Sevan (excessive intake of sour)** [9]

Amla ahara may be taken as foods with predominance of tomatoes, sour curd, lemons, citric acid, pickles & food with preservatives as jams, cold drinks, sauces, Imli etc. if it consumed excessive then aggravates the Kapha through dilatation (Kapha vilapayati), increase the Pitta dosa, vitiated Rakta (blood) etc. Pitta & Rakta are the most important factors for the production of Pandu. According to modern patients with iron deficiency anaemia whose bodies cannot absorb iron may benefit from adding foods rich in vitamin C to their diet. Vitamin C plays an important role in iron metabolism and application for red blood cell formation. Phytates and phytic acid (presents in wheat, legumes, nuts and brown rice etc.) can inhibit iron absorption by binding with the iron of digestive system.

**Ati lavishan sevan (excessive intake of salt)** [10]

Lavanahararasa (excessive intake of salt taste) may be taken as food with excess salt or with salt added from above. According to compendium excessive intake of Lavana rasa vitiates the Rakta dhatu (blood cells). A high salt diet can contribute to high blood pressure, cardiovascular diseases, stomach cancer, kidney diseases, renal stones, obesity etc. We know that Pandu is categorized under the Santaroanaja & Apatarpanaja vyadhi. Consumption of salt also affects the sickle cell anaemia through hyponatremia or hypernatremia.

**Ati usna nidana sevan (consumption of excessive hot substances)** [11]

Ati usna in terms of tea, coffee etc. are responsible for the increase of metabolic activity of the body, but it causes iron deficiency anaemia by interfering with absorption of iron. Ati usna bhajan also the cause of Raktabahasrotadusti.

**Ati madya sevan (excessive intake of alcohol)** [12]

Alcohol can cause anaemia in a few different ways. Heavy drinking has been linked to a decrease in red blood cells which further leads to damage to heart, internal inflammation, and a lowered immune system. People who drink heavily are less likely to prioritize nutrition and may even skip meals entirely in favor of alcohol. This behavior can lead to sever nutritional deficiencies. A poor diet can cause iron deficiencies, folate deficiencies, and Vit B-12 deficiencies that may all leads to anaemia. Consumption of alcohol also cause of megaloblastic anaemia by hampering the folate absorption.

**Viruddha bhojana, Pinyaka, Nispava, Masha & Asatmya bhojan** [13]

Consumption of Viruddha ahara in terms of incompatible diet, Asatmya bhojana may be considered as sudden changes of food style or habit or also as junk food used to day as they are not beneficial, Pinyak -oil cake in terms of Panipur, pakore, pithe, puli etc. & Nispva-legumes etc. may cause aggravation of Pitta along with the alteration of Agni, produced Mandagni by increasing Kapha which ultimately leads to abnormal Dhatu paka and become responsible for the Dhatu kshayaja pandu.

**Vidagdha bhojana**

Vidagdha ahara or Khara paka ahara in terms of food prepared through the grilling, broiling, roasting, searing & frying etc. such as grilled meat, fish etc. are also responsible for the Pandu through hampering the functions of Agni. According to modern food prepared through the grilling (260°C), broiling (225°C), roasting (177°C), searing (150°C), deep-frying (180°C) & oven frying (230°C) methods are the main source of AGEs (Advanced Glycation End products) formation which also known as Amodari products & these cooking process can generate carcinogenic chemicals. Products (AGEs) have been implicated in the oxidant-induced vascular pathology of diabetes and other diseases. Because homozygous sickle cell anaemia is a state of oxidative stress & due to this AGEs level are elevated in sickle cell anaemia. The impaired biosynthesis of the betaglobin chain in beta thalassemia leads to the accumulation of unpaired alpha globin chains, failure to production of haemoglobin, and iron overload due to the frequent blood transfusion. Iron excess causes oxidative stress and massive tissue injuries. AGEs are harmful agents, and their production accelerate in oxidative condition, which may play an important role in the pathogenesis of beta-thalassemia major.

**Mridbhakshan (consumption of mud/pica)**

It may be considered as either oral ingestion of mud or use of articles contaminated with mud as unclean hands and fingers or as improperly washed vegetables or eatables which may leads to worm manifestation. Through this worm manifestations (feco-oral rout), leads to nutritional deficiency or Krimija pandu.

A severe iron deficiency can cause people to crave or eat dirt or mud or pica. It is most commonly seen in pregnant women, small children, and persons with developmental disorders like autism. But relation between eating mud or pica & iron deficiency, with or without anaemia the reason is unclear.

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Vyavaya- vyayamatiyoga

Physical exercise is good habit and it should be practiced everyday for the maintaining of proper health. But if a person undergoes excessive physical exercise, he become weak and lean & causes vitiation of Vata dosa which may lead alteration Agni & besides this excessive sexual indulgence causes Dhatukshaya which may lead to Vataparakopa. 

Divaswapan (sleeping during day times)

It can cause vitiation of Kapha dosa which leads to Mandagni and finally responsible for Pandu.

Vegdhranam-chhardi vega

Rural life as well as urban life becomes faster now-a-days rather than few years back. Everyone is so busy and none of them has time to look after own health. Chardri vegdharan may leads to Pandu.

Manasik nidan (Shoka, Chinta, Bhaya & Krodh)

Excessive affliction of Shoka (grief), Chinta (thought) & Bhaya (fear) can raise Vata dosa, alter all types of Agni mainly Jatharaggni and which ultimately interrupt the process of Avasthapaka (digestion) & Nisthapaka (metabolism). By this way, production of Ama as well as defective in Dhatus along with their respective ojas take place. Krodh is anger and it responsible for elevation of Pitta which is the most important Dosa in Pandu.

Ritu vaisamya (transgression of prescribed seasonal regimens)

Due to the to-days busy schedule or availability of everything one cannot maintained the proper dietetics and life style according to season which may lead to Pandu through the aggravation of Pitta and vitiation of Rasa, Rakta, Mamsa & Meda but this not have been confirmed till now through modern scientific studies.

Pandu is a Santarpanja vyadhi. According to modern over nutrition may cause of anaemia. Obesity involves impaired duodenal iron absorption associated with low expression of duodenal ferroprotein (FPN) along with elevated hepcidin concentration, causes decreased serum iron. The low iron status in over weight individual results combination of nutritional (reduced absorption) and functional (increased sequestration) iron deficiency.

CONCLUSION

This study reveals that Pitta (Pachak, Ranjak, Bhrajaka & Alochak) & Vata (Saman, Vyan) are the main Dosha and Twak, Rakta, Mamsa & Meda are the Dushyas of Pandu. The Aharaja & Viharaja nidan plays a prime role in the vitiation of them. These Nidan vitiate the Kapha, Rasa, Rakta, Mamsa & Meda through the alteration of Agni, which leads to the vitiation of Grahani, nutritional deficiency or Dhatukshaya and ultimate fate is Pandu. This observational study is found as very much significant through studying Aharaja & Viharaja nidan. Modern sciences also reveal that dietary habits & lifestyle factors (sedentary lifestyle) are primarily cause of nutritional deficiency. Therefore, early diagnosis and timely intervention with proper management along with Nidan parivarjana are highly essential to prevent Pandu. After evaluation of these factors, it can be concluded that, Aharaja & Viharaja nidan had been justified in the pathogenesis of Pandu which was depicted in different Ayurvedic compendium & about the scenario of Nidan in this particular population were suffering from Pandu.

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