1. Introduction

Impairment of the Agni is one of the most important etiological factors for causation of diseases as per Ayurveda. There are 4 types of Agni – Samagni (normal digestive, assimilation and metabolic power), Mandagni (reduced power of digestion, assimilation and metabolism) Teekshnagni (Intense power of digestion, assimilation and metabolism) and Vishamagni (Some time intense and some times reduced power of digestion, assimilation and metabolism) [1, 15/50-51] among them only Samagni is normal and other types being harmful. Impaired state of Agni results in various diseases or disease combinations. Most of the people experience digestive problems like constipation, diarrhoea, acid eructations, loss of appetite etc. at some stage of life. These are the acute conditions that appear due to Agnimandya (reduced power of digestion, assimilation and metabolism). Conditions that may cause Agnimandya include changes in diet and lifestyle and chronic diseased conditions. When the Agnimandya or the conditions that may cause Agnimandya persist for longer duration it turns into a life threatening disease. When Deshas (body humours) get aggravated, they affect the Agni (Power of digestion, assimilation and metabolism) and thus the food taken is not digested properly forming the Ama (morbid material). Ama when formed is accumulated in the body over the period of time, forming roots of many diseases.

In the present case study the patient has Agnimandya, because of the chronic metabolic conditions. The Agnimandya and consequent nutritional deficiencies are addressed, while preparing the treatment protocol. The central focus of Ayurvedic treatment is the management of Agni and the Ama. The diet was advised on the line of Samsarjana Krama (Sequential administration of liquid diet to normal diet to kindle the Agni or digestive power) and the effect of treatment was analysed after 1 month. The symptoms of the diseases were reduced along with the improvement in the Agni and the nutritional status.
diseases with distinct features pertaining to the deranged Srotas (channel). Protection of Agni is the first and foremost principle of the Ayurvedic management [2, Chikitsa Sthana; Grahni Chikitsa, Ch 15/39-40]. Agni can be preserved by following correct rules for lifestyle and diet. Ayurvedic dietetics involves eight rules known as “Ashta Ahara Vidhivisheshayatana” [2, Vimana Sthana; Rasa Vima-ch 8/94]. The gradual inclusion of progressively heavy food from light food like Manda (liquid part only), Peya (includes both liquid and rice grains), Vilepi (More rice grains with little amount of liquid), Krishara (Semi solid preparation made of pulse and rice) to Bhakta (Rice) or Rotika (Indian pan cake), Yusha (Soup made of pulses) in a sequential order in Samsarjana krama (Graduated dietetic protocol), enhances Agni [2, Siddhi Sthana; Kalpana Siddhi, Ch 1/12] and brings about better acclimatization.

2. Case report

2.1. Chief complaints

Anannabhilasha (loss of appetite) – since 3 weeks; Adhovata and Urdhivavata (flatulence and belching) - since 3 weeks; Daurbalya in limbs (weakness in limbs) - since 3 weeks.

2.2. History of present illness

A 59 years old female, visited Lifestyle OPD of AIHA, with complaints of Anannabhilasha (Loss of Appetite) along with early satiety, Amlapitta (Hyper-acidity), Adhovata and Urdhivavata (Flatulence and Belching) and general weakness along with tachycardia. Patient also complained of constipation. Disturbed sleep along with restlessness at night was also reported. Detailed Examination (Table 1) was done following Trividha and Dashvidha Pareeksha[2, Vimana Sthana; Rogabhishagjitiye Ch 8/94].

2.3. History of past illness

Patient has a history of diabetes (Type2), hypertension, hypothyroidism and CHD. Patient has a history of angioplasty and cholecystectomy.

2.4. Medication history

She is on allopathic medicines for above said multiple ailments-Metformin-500mg BD, Ecosprin-75mg OD, Eltroxin-75 mg OD, Gabapentine-OD, LASix –OD.

2.5. Family history

She has a family history of diabetes, hypertension and CHD.

2.6. Personal history

Prakriti was assessed using the PPAT (by S Rastogi and Prakriti) was found to be Vata- Kaphaj. Dietary information before intervention is provided in Table 2.

2.7. Vitals

Temperature – 96.3°F; BP- 90/50 mm Hg; Pulse – 128 pm; Respiratory rate – 13 pm; RBS -287; No history of Addiction (both tobacco and alcohol); No Food Allergies; Allergic to Ibuprofen.

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Table 2
Dietary intake (24 h Recall) before intervention.

| Timings          | Dietary items taken                        | Quantity with calories |
|------------------|--------------------------------------------|------------------------|
| Early morning    | Tea with toast                              | 2 toasts, 1 cup with 50 mL toned milk without sugar (87 calories + 60 calories) |
| Breakfast        | Bread/Roti, Sabzi (mostly potato)           | 2 pieces/1 piece, 60–70 g (170/100 + 40 calories) |
| Lunch            | Roti-1, Sabzi – seasonal (1/4th small bowl) | 1 piece (30 gms), 50–60 g (100 + 40 calories) |
| Mid Evening      | Tea                                         | 1 cup with 50 mL toned milk without sugar (60 calories) |
| Diner/Supper     | Roti-1, Sabzi (1/4 small bowl)              | 1 Piece (30 gms), 50–60 g (100 + 40 calories) |

Remarks: *Mostly patient skipped Dinners.
*Total calories being consumed by patient is 697 calories. Based on the Robinson formula (1983), your ideal weight is - 67.5 kgs Calories reqd.is- 1575.
*Calorie calculations [3].
3. Detailed history before treatment

3.1. Agni

There is a significant change in the Appetite of the patient in the past 3 months and the amount of food intake has reduced to <75% (previously used to eat – 3 chapati now 1 chapati, no rice intake and the amount of vegetable from 1 full bowl to less than half bowl). Agni was assessed based on the “Abhyavaran Shakti” and “Jaran Shakti”. Abhyavaran shakti was assessed by the decrease in the amount of intake of food. Jaran Shakti was assessed by the patient’s complaint of flatulence. Also the patient experiences early satiety and sweating and heaviness while taking meal.

3.2. Anthropometric measures

Height = 150 cm; Weight = 45 kgs (weight loss in past 3 months–10 kgs); Mid arm circumference = 12 cm; Waist circumference = 36 cms; Waist – Hip Ratio = 0.5.

3.3. Features of depletion of Doshah (body humours) and Dhathu (body tissue)

Ruksha kesha (dry hair), Ruksha tvak (dry skin), Alpacheshtasu Hridrava (Palpitations on little efforts), Arasajnata (tastelessness), Hridrava (palpitations), Hrullasa (nausea), Oshta sputana (cracking of lips), pallor, decreased waist to hip ratio, Sandhi shishihata (Weakness of joints), Bhngura Danta (brittle tooth), Danta Shoola (pain in dentures), Mukha Shosha (dryness of mouth), Daurbalya (fatigue), Durmana (irritable).

4. Intervention

The patient was advised to take Sadhita Manda (liquid part after cooking 1 part of rice in 14 parts of water followed by seasoning with ghee, ginger, long pepper, black pepper and rock salt), for 2 days until the normal hunger is regained. This was followed by Peya and Yusha for 1 week then Vilepi for 1 week.

Followed by Yavagu for 1 week and then the appetite of patient gradually improved and diet was shifted to normal. The adherence and tolerability was assessed by daily follow up of the patient (on call). (The details of the intervention is provided in Table 3)

Along with this patient was also taking fruits, tea and milk.

Apple (salt and pepper added) 100 gms, 60 calories twice daily; Pomegranate 100 gms, 80 calories once daily; Tea 120 ml (1 cup with toned milk without sugar), 60 calories; Roasted makhana (50 gms) - 180 calories; Marie biscuits [2, Vimana Sthana; Rasa Vimanaya, Ch 1/ 21] - 50 calories; Vegetable soup - 64 calories

Patients total calorie intake was gradually increased to 1200 calories keeping in mind the amount of nourishment required and the Agni of the patient.

Table 3

| Intervention          | Ingredients                                                                 | Method of preparation                                      | Properties                                                                 | Anupana                  | Duration and frequency | Remarks                        |
|-----------------------|------------------------------------------------------------------------------|------------------------------------------------------------|---------------------------------------------------------------------------|--------------------------|------------------------|--------------------------------|
| Sadhita Manda         | Red Rice, Water, Trikatu (Powder of black pepper, long pepper and ginger in equal proportion), Saindhava lavana (Rock salt), Ghrita (cow’s ghee) | 1 part (1/4 cup-50g) rice cooked in 14 parts (3.5 cups-700 ml) water seasoned with ghee, ginger, long pepper black pepper and rock salt | Dīpāna (Kindles digestive power) and Puchana (Digests accumulated Ama)  | Warm water (Ushna jala) | for 2 days three times a day (120 ml, 120 calories) + 1/2 tsp Ghee (22.5 calories) | Patient was asked to mix Peya and Yusha together |
| PEYA                  | Red rice, Water, Trikatu (Powder of black pepper, long pepper and ginger in equal proportion), Saindhava lavana (Rock salt), Ghrita (cow’s ghee) | 1 part rice Green gram (1/4 cup-50g) cooked in 14 parts water with Trikatu (Powder of black pepper, long pepper and ginger in equal proportion), Saindhava lavana (Rock salt), There are few rice grains the Peya 1 part rice (1/4 cup-50g) cooked in 4 parts (1 cup – 200 ml) water with Trikatu and Saindhava | Light (Quickly Digestable), Dhuṭupa (pushiṭikara) (nourishes the tissues), Balukaraka (strengthening) | Warm water (Ushna jala) | for 1 week three times a day (120 gms, 140 calories) + 1/2 tsp Ghee (22.5 calories) + Yusha (100 Calories) | |
| VILEPI (Rice gruel with less amount of water) | Red rice, Water, Trikatu (Powder of black pepper, long pepper and ginger in equal proportion), Saindhava lavana (Rock salt) | 1 part rice (1/4 cup-50g) cooked in 4 parts (1 cup – 200 ml) water with Trikatu and Saindhava | Dhatuvardhaka (nourishes the tissues), Hrudya (good for heart) | Buttermilk spiced | for 1 week 2 times a day (150 gms, 170 calories) + 1/2 tsp ghee (22.5 calories) + Yusha (150 gms, 100 calories) | Patient was eating it with Yusha (150 gms, 100 calories) |
| YAVAGU (thick gruel) | Red rice, Water, Trikatu (Powder of black pepper, long pepper and ginger in equal proportion), Saindhava lavana (Rock salt), Ghrita (cow’s ghee) | 1 part (1/2 cup-100g) rice cooked in 6 parts water (3 cups-600 ml) with Trikatu and Saindhava. | Balyo (provides strength), Tarpaṇi (provides satiety), Vata Nushini (alleviates Vata) | buttermilk spiced (200 ml - 80 calories) | for 1 week 2 times a day (150 gms, 170 calories) + 1/2 tsp ghee (22.5 calories) + Yusha (150 gms, 100 calories) | This was used with the above said preparations as advocated. |
| YUSHA (lentil soup)   | Moong Dal (Green Gram), water, Trikatu (Powder of black pepper, long pepper and ginger in equal proportion), Saindhava lavana (Rock salt), Ghrita (cow’s ghee) | moong Dal (1/2 cup-100 g) cooked in 14 parts (7 cups-700ml) water with Trikatu and Saindhava. | Balyo (provides strength), Kanthya (good for throat), Laghu paka (easy to digest) and Kaphahara (reduces Kapha) | buttermilk spiced | for 1 week 2 times a day (150 gms, 170 calories) + 1/2 tsp ghee (22.5 calories) + buttermilk spiced (200 ml - 80 calories) | |

*Calories calculation was done by the standard method [4]. *Calories are calculated for the food article as a whole and not for the individual ingredients.*a full cup measures 200 gms/ml [4].
5. Results

Patient was treated from October 2018 to November 2018. Outcome on all the parameters showed significant improvement. The weight of the patient increased from Kg to 48 Kg in 36 days (Table 4) Tachycardia improved and pulse rate at the 36th day was within normal limits (86 BPM). Food intake was increased to 75% which was less than 75% in the beginning of the study (measure-ment was done based on the required calorie intake. In the beginning, a few changes were made including walking after meals as advised Break fast Sedentary Active
Lunch and Dinner (Activities like watching TV/Reading newspapers/Talking with friends etc.)

In case of wholesome food intake, medicine is not required and medicines won’t do any good in case of unwholesome food intake [1, Vimana Sthana; Rogabhishagjitiye, Ch 8 / 94]. By taking wrong type of food different Doshas gets aggravated, dry, light etc. food items having similar properties as Vata, increases the Vata [2, Chikitsa Sthana; Grahni Chikitsa Ch 28/15] and heavy foods, oily foods increases the Kapha (Sutra 1/66, Page 18) [2, Sutra Sthana; Deerghanjivitiyi, Ch 1/66]. When Doshas are aggravated they affect the Agni in different ways. Because of Vata sometimes there is Mandagni and sometimes Teekshagni [5]. The root cause of all the diseases is Agnimandya. In this particular case the patient has a disease complex of hypothyroidism, diabetes mellitus, hypertension and cardiac disorders. The first problem that patient suffered was hypothyroidism, which is otherwise correlated to Medo Dhatvagnimandya [6], followed by other diseases. Diabetes mellitus is a type of Vataja Prameha, Agnimandya due to Vata [5] is thus one of

| S. No. | Parameters | Before treatment (9/10/2018) | After treatment (16/11/2018) |
|--------|------------|-----------------------------|-----------------------------|
| 1      | Weight     | 45 kgs (weight loss in past 3 months–10 kgs) | 48 kgs                      |
| 2      | Pulse rate | 128 Per minute              | 86 Per minute               |
| 3      | RBS        | 287 gm/dl                   | 162 gm/dl                   |
| 4      | Food intake| <75%                        | 75%                         |
| 5      | Early satiety | Present                  | Absent                      |
| 6      | Sweating & nausea | Present            | Sweating decreased, nausea absent |
| 7      | Bowel      | On and off constipation with flatulence | Mild relief in constipation, no flatulence |
| 8      | Rasa Kshaya (Depletion of body fluids) | Ruksa kesh (Dry hair), Ruksa Tvak (Dry Skin), Hridvra (Palpitations on little efforts), Arasagyta (Tastelessness), Hrullas (Nausea) | Decrease in palpitations and nausea No improvement noticed in twak and Kesha |
| 9      | Rakta Kshaya (Depletion of blood) | Tvak sputana (Cracking of lips), pallor | Decrease in pallor, cracking of lips |
| 10     | Mansa Kshaya (Depletion of flesh) | Kshya (Mid arm circumference — 12 cm) | Improved to moderate (13 cms) |
| 11     | Meda Kshaya (Depletion of fat) | Sandhi shithilata (Weakness of joints) Waist – Hip Ratio — 0.5 | Decrease in weakness of joints Relief in tooth ache |
| 12     | Asthi Kshaya (Depletion of bone) | Bhangura danta (Brittle tooth), Danta Shoola (Pain in dentures) | No dryness of mouth |
| 13     | Majja Kshaya (Depletion of bone marrow) | Mukha shosa (Dryness of mouth) | |
| 14     | Oja Kshaya (Depletion of factor responsible for immunity) | Daurbalya (Fatigue), Durmana (Irritation) | No fatigue |

and the gap between sleep and meals was increased (Table 5). There was improvement in the patient’s overall condition post treatment on 37th day.

6. Discussion

| Activities | Practice before treatment | Current practice | Remarks |
|------------|---------------------------|------------------|---------|
| Time of food: Breakfast F-8-9 am Lunch – 2 pm, Dinner: 8—9 pm | Same time | No change | No change |
| Ushnam Ashniyot - Do u take food warm? If yes, When? Breakfast, Lunch and Dinner | 3/3 | 3/3 | No change |
| Atimatra - How often in a week, do you over eat? (Discomfort after food frequency) | Never | Never | No change |
| Heemaatra - Do you intentionally eat less? If yes, how often in a week | Yes | No | Nausea cured |
| Ajopan, Ahasan, Tamanna Bhunjere? ??-What are your activities during your food intake? Breakfast, Lunch and Dinner (Activities like watching TV/Reading newspapers/Talking with friends etc.) | None | None | No change |
| Adhirutam/Atvilambitam- What is your average duration of food intake? [In Minutes] Breakfast, Lunch and Dinner 10–15 min each. | Same time | No change | No change |
| Do you take food on regular times regularly? If irregular, how often in a week? | Regular 3/3 | Regular 3/3 | No change |
| Do you eat other than your regular meal times? If yes, how often? Activity after meals | No | No | Started walking after meals as advised |
| Break fast | Sedentary | Active | |
| Lunch | Sedentary | Active | |
| Dinner | Sedentary | Active | |
| Gap between meals and sleep | 1 h | 2 h | Increased as advised |
the outcomes of *D.mellitus* [2, Sidana Sthana; Prameha Sidana, Ch 4 (48–49)]. *Agnimandya* plays a very crucial role in the pathogenesis of almost all the above mentioned diseases in the patient. Hence, correction of *Agni* is the most important part in the treatment.

Apart from *Agnidipana* the other factors that should be considered, while prescribing a dietary intervention is the nutrient quality of the food articles. The *Manda, Peya* and *Vilepi* are taken in the current study, because these food items are time tested for enhancement of *Agni*, and are used in *Samsarjana Krama* also [2, Sidhi Sthana; Vamanvirechan vyapad Sidhi, Ch 6/24]. *Manda, Peya and Vilepi* were prepared using rice and water (in varying amount), to gradually increase the *Agni*. *Manda* is easily digestible as it is iso-osmolar with the human body fluids (*Osmolarity is the amount of total number of solute particles in a liter of liquid* [7]). In *Peya* the amount of grains is more as compared to the *Manda*, but the amount of water was kept equal (14 parts), the food is also and brought about *Raktavridhdi* the fuel for *Agni*. Apart from enhancing the *Agni* these dietary items are high in nutrition and hence cover the nutrient loss also.

While giving the various preparations ‘*Trikatu*’ and ‘*Ghrita*’ were added as adjuvant, both *Trikatu* [5] and *Ghrita* act as *Deepana* (enhance digestion) and thus enhance the absorption of nutrients in food and active principles in medicines. *Trikatu* helps in digestion of *Ama* formed due to *Agnimandya* and *Trikatu* also prevents further *Ama* formation [8, ch 38/59]. *Ghrita* reduces the dryness due to its *Snigdha* (unctuousness). As per eight factors of food intake (*Ashta Ahara Vidhi*) intake of unctuous food is advocated [2, Vimana Sthana; Rasa Vimanjya, Ch 1/21], in this case intake of ghee enhances *Agni*. *Peya* and *Vilepi* were advised to be taken with *Madga Yusha*, as it breaks the monotony of the taste and also enhances the nutritive value by adding the limiting protein methionine in the rice meal. Warm water was advised after the meals as it quenches the thirst and also it helps in enhancement of the *Agni* and is always conducive to the human beings [8, ch 45/39–40]. Also, *Takra* (butter milk) was advised along with the *Vilepi*, as it enhances the *Agni* and also reduces obstruction in channel due to *lekhana* (scrapping) property [8, ch 45/74].

Apart from the dietary preparations given at the meal time, patient was also taking fruits and tea. Only apple and Pomegranate were advised to be taken with the seasoning of salt and pepper. Apple is high in nutrients, with salt and pepper there is increased digestibility and absorption. Pomegranate helped to reduce palpitation due to *Pittahara, Hridya* (cardiac tonic) property and brought about *Raktavridhdi* [9], by rich minerals, vitamins and antioxidants. As the patient was accustomed for intake of Tea, it was restricted to only 2 cups/day. Lifestyle of the patient before treatment was well managed and hence no changes were made.

7. Conclusion

The case mentioned above was diagnosed with Vyadh Sankara in terms of Ayurveda, patient’s condition was deteriorating, because of the *Agnimandya*. The dietary advice was given on the line of *S. krama* to improve the status of *Agni*, which was the root cause for multiple ailments. The *Agni* improved and also nutritional status showed a little improvement with relief of symptoms like nausea, palpitation, pallor and cracking of lips after treatment.

8. Future recommendations

Cases of chronic *Agnimandya* can be treated in the line of *Samsarjana Krama* with success. This line of dietary intervention not only enhances the *Agni*, but also improves the nutritional status.

9. Strengths and limitations

There is very limited work on how Ayurvedic diet can help a patient in various diseases. And a very little published work is available on Ayurvedic diet as an intervention; the strength of this work is that the author has used only Ayurvedic methods of diet and lifestyle assessment and intervention.

Limitations — this work could have been more comprehensive, if the Ayurvedic assessment scales for nutritional status and quality of life were available.

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None.

**Conflict of interest**

None.

**Appendix A. Supplementary data**

Supplementary data to this article can be found at [10.1016/j.jaim.2021.01.004](https://doi.org/10.1016/j.jaim.2021.01.004).

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