Clinical Research
Observations on Vamana procedure in healthy volunteers

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Abstract
Vamana Karma is one of the five Pradhana Karmas of Panchakarma which is successfully used in treating Kaphaj disorders. Panchakarma is also indicated in healthy states. (C.Su. 16/13-16) for Shodhana. Textual references are available in Ayurvedic classics, but the procedure needs to be validated in the modern times when Ahara Shakti, Bala and Agni of the individuals have decreased considerably. So the effect of procedure was observed in 30 healthy volunteers of age group 18 to 60 years. Lakshanik, Vaigiki, Maniki and Antiki Shuddhi were observed and vomitus was analyzed macroscopically, microscopically and chemically.

Key words: Agni, Ahara Shakti, Bala, Kaphaj disorders, Panchakarma, Shodhana, Vamana Karma

Introduction
Panchakarma is an important component of Ayurvedic treatment, which eliminates vitiated doshas from the body. Vamana, a Pradhana karma of Panchakarma, is an important Samshodhana procedure (bio-cleansing method) recommended for cleansing of bahudoshas.

In modern times, Ahara, Agni, Bala and Vyayama Shakti of the individuals have diminished considerably. So it is worthy to observe the Vamana procedure in modern times in normal healthy individuals.

Thus keeping in view the above facts, the intake and output of fluid, the vegas of Vamana, the duration of the procedure (Vaigiki shuddhi, Antiki Shuddhi, Maniki shuddhi etc.) were studied in the present study.

Materials and Methods
The present study was carried out at Ayurveda Central Research Institute, Delhi in collaboration with Dept. of Physiology, AIIMS on 30 apparently healthy volunteers between the age group of 18 and 60 years.

Inclusion criteria
• Apparently healthy volunteers
• Age group: 18 years to 60 years

Exclusion criteria
• Patients of hypertension, diabetes, renal diseases, peptic ulcer, jaundice, acute infections, dehydration and other chronic diseases which are contraindicated for Vamana Karma as detected by clinical history/investigations.
• Age group: Less than 18 years and more than 60 years
• Patients with lactose intolerance
• Pregnant/lactating women

Procedure adopted
Volunteers’ written consent in Hindi was taken and information about the study was provided in information sheets on the ‘0’ day. Physical examination along with physiological parameters assessment was done before, during and after Vamana. Routine haematological investigations were done before Vamana to exclude underlying pathology, if any.

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SOP for Snehapana

For the procedure, apparently healthy individuals were subjected to Snehapana with slightly warm non-medicated mother dairy ghee in milk or Khichari or dalia in the morning for three to seven consecutive days till complete Sneha was achieved since most of the volunteers were not ready to take Aachha Snehapana (A.H.Su.16/16). Sneha was given in following doses:

- First day - 50 ml
- Second day - 100 ml
- Third day - 150 ml
- Fourth day - 200 ml, and so on, not beyond seven days

Snehapana was continued for minimum three to maximum seven days as per the digestive capacity (Agnihata) of the volunteers in increasing doses. Some Mridukoshthi or Sukumara Prakriti volunteers were not able to take 50, 100 and 150 ml Ghrita as they complained of nausea, loose motion, heaviness and loss of appetite. In such volunteers, the dose of Snehapana was given up to their tolerance and recorded. However, in normal conditions, the appearance of fats in the stool was considered as the end-point of the Snehapana procedure (Samyak Snigdha Lakshanai).

After Snehapana, the volunteers were given Abhyanga for 15 or 20 minutes (with Mahanarayana tila IMPCI). Duration of massage was decided according to Ahara-Shakti and Vyayama-Shakti of the volunteers. Thereafter, Bashpa swedana (plain water steam) was given for 10-15 min (according to the bal of the volunteers). Most of the volunteers were given Kapha bahula diet on the day prior to Vamana e.g. daliya or kheer.

On the Vamana day in the morning, the volunteers were given Madhuyashti Kwatha mixed with equal quantity of boiled and cooled (37-40°C temperature) milk up to patient’s satisfaction. The 2-4 g Madanphala (beej-majja powder) with honey was given for licking. Usually, the patients started instantaneous vomiting or vomiting within 15-20 min after the completion of the fluid intake. The emesis continued in bouts. The vomitus of first bout, second bout, third bout and so on was collected in separate graduated plastic transparent jars. The physical and chemical examinations were carried out on vomitus. The details of vamaka dravya studied are given in the Tables 1-5.

Analysis and TLC of Madhuyashti choorna and Madanphala choorna were done.

SOP for preparation of Madhuyashti Kwatha

The 60 to 75 g of coarse Madhuyashti (Glycyrrhiza glabra) root was boiled with 3 l of water to leave Chatthurthamsa i.e. 750 to 1000 ml of decoction. This decoction was added to equal quantity of boiled and cooled mother dairy full cream milk. Saindhava salt 5 g was added to this mixture.

Paschat Karma

Complications if any were managed and recorded. Emergency medicine and ORS was kept ready to deal with any emergency. The patient was advised to take Shikani (i.e. water 250 ml, sugar 25 g, lemon half and salt 2 g) after some time so as to provide natural ORS and instant energy. Later Khichari (thin gruel made with moong daal and rice) was given at Ahara Kala.

On the next Ahara Kala, normal Khichari was given. Adequate rest was advised to the patient. After one to two days, the volunteers switched on to normal diet.
Observations

The Vaigiki Shuddhi (number of bouts), Antiki Shuddhi (end point of Vamana) and Maniki Shuddhi (volume of vomitus in each bout) and Lakshanik Shuddhi (symptoms of proper cleansing) were assessed.

Macroscopic examination of Vomitus included quantity, colour, consistency, pH, specific gravity, presence of mucus and blood in the vomitus. The vomitus was microscopically examined for the presence of RBCs, WBCs, epithelial cells and parasites etc. Chemical examination of vomitus included presence of bile salts, bile pigments and proteins.

It was observed that all the volunteers consumed 50 ml of ghee on first day. 11 volunteers consumed 50 ml of ghee on day II while 19 volunteers consumed 100 ml of ghee on day II. On day III, only six volunteers could consume 150 ml of ghee while 13 volunteers consumed 100 ml of ghee each as shown in the table. None of the volunteer could take ghee on day IV [Chart 1, Table 6].

The maximum time of Abhyanga (taken by seven volunteers) was 20 min and minimum time of Abhyanga (taken by 23 volunteers) was 15 min.

The maximum time of Svedana (taken by eight volunteers) was 15 min and minimum time of Svedana (taken by 22 volunteers) was 10 min [Table 7].

In 66.7% of the volunteers, Snehapana was stopped due to the appearance of fats in the stools i.e. sticky stools as observed by the volunteers. However, in some volunteers, Snehapana was stopped because of loss of appetite, heaviness, nausea or both [Table 8].

It was observed that maximum no. of volunteers (27) consumed the fluid (milk and Madhuyashti Kwatha) within 5 min. Maximum time taken to consume fluid was 15 min and minimum time required to consume fluid was 1.1 min [Table 9].

It has been observed that 23 volunteers (76.67%) initiated the Vamana procedure within 0-4 min. The maximum time taken by the volunteers for initiation of Vamana after fluid intake was 10.45 min [Table 10].

The minimum time required to vomit the fluid was 3.02 min while the maximum time required to vomit was 31 min [Table 11].

| Table 6: Quantity of ghee intake by volunteers during Snehapana |
|-----------------------------------------------|
| Quantity of ghee (in ml) | No. of subjects |
| Day I | Day II | Day III |
| 50 | 30 | 11 | 9 |
| 75 | 0 | 0 | 2 |
| 100 | 0 | 19 | 13 |
| 150 | 0 | 0 | 6 |
| Total | 30 | 30 | 30 |

| Table 7: Time (in min) of Abhyanga and Svedana before Vamana |
|-----------------------------------------------|
| No. of subjects | Abhyanga | Svedana | Time (in min) |
| 22 | 10 |
| 8 | 15 |
| 0 | 20 |
| 30 | Total |

The maximum time of Svedana (taken by eight volunteers) was 15 min and minimum time of Svedana (taken by 22 volunteers) was 10 min [Table 7].

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| Table 8: Symptoms to end Snehapana |
|-----------------------------------------------|
| End point of Snehapana | No. of subjects | Percentage |
| Appearance of fats in the stools | 20 | 66.7 |
| Heaviness | 2 | 6.7 |
| Nausea | 1 | 3.3 |
| Heaviness and nausea (both) | 4 | 13.3 |
| Loss of appetite | 3 | 10.0 |
| Total | 30 | 100.0 |

| Table 9: Duration of fluid intake in volunteers during Vamana procedure |
|-----------------------------------------------|
| Duration of fluid intake in minutes | No. of subjects |
| 1–5 | 27 |
| 5–10 | 2 |
| 10–15 | 0 |
| 15–20 | 1 |
| Total | 30 |

| Table 10: Time taken for Vamana initiation |
|-----------------------------------------------|
| Time taken for Vamana initiation in minutes | No. of subjects |
| 0–4 | 23 |
| 4–8 | 3 |
| 8–12 | 4 |
| Total | 30 |

| Table 11: Duration of Vamana process after drug intake |
|-----------------------------------------------|
| Duration of Vamana process in minutes | No. of subjects |
| 3–13 | 21 |
| 13–23 | 8 |
| 23–33 | 1 |
| Total | 30 |
In maximum number of volunteers (66.7%), the Vamana procedure finished with Pitta (bile) in the vomitus. In 33.3% of volunteers, the Vamana procedure ended with Kapha (mucus) in the vomitus [Table 12].

The minimum number of bouts of Vamana was 2, while the maximum number of bouts was 4. However, the sub-bouts ranged from 4 to 8, as shown in Table 13.

1. **Maniki Shuddhi** (quantity of vomitus) as observed during Vamana procedure

   In first bout, maximum quantity of vomitus was 900 ml.
   In second bout, the maximum quantity of vomitus was 900 ml.

   In third bout, the maximum quantity of vomitus was 350 ml.
   In forth bout, the maximum quantity of vomitus was 300 ml.

   It has also been observed that maximum quantities of vomitus came out during first and second bouts [Chart 2].

   Among 30 volunteers so studied, the maximum quantity of fluid taken was 2500 ml while maximum quantity of fluid output was 1700 ml. In all the volunteers, the intake of the fluid was a little more than the output [Table 14, Chart 3].

### Examination of vomitus

(a) Macroscopic examination of the vomitus

| Color | Consistency | pH | Specific gravity | Mucus | Blood |
|-------|-------------|----|-----------------|-------|-------|
| White | Initially clear | 6-6.5 | 1.03 | Present in all bouts | Absent in few |

(b) Microscopic examination of the vomitus

#### Table 12: Antiki Shuddhi as observed at the end of Vamana in volunteers

| Symptoms at the end point of Vamana | No. of subjects | Percentage |
|-------------------------------------|----------------|------------|
| Kaphanta (mucus at end)             | 10             | 33.3       |
| Pittanta (bile at end)              | 20             | 66.7       |
| Total                               | 30             | 100.0      |

#### Table 13: Vaigiki Shuddhi (number of bouts and sub-bouts) as observed during Vamana procedure

| Frequency of major bouts | Frequency of sub-bouts | Total no. of Vegas |
|--------------------------|------------------------|-------------------|
| 3                        | 3, 3, 2                | 8                 |
| 3                        | 2, 1, 2                | 5                 |
| 4                        | 2, 1, 2, 1             | 6                 |
| 3                        | 2, 3, 1                | 6                 |
| 2                        | 2, 2                   | 4                 |
| 3                        | 3, 2                   | 5                 |
| 3                        | 2, 3, 1                | 6                 |
| 2                        | 2, 2                   | 4                 |
| 4                        | 2, 1, 1, 2             | 6                 |
| 3                        | 3, 2, 1                | 6                 |
| 2                        | 2, 1, 2                | 5                 |
| 3                        | 2, 2, 2                | 6                 |
| 3                        | 2, 2, 1                | 6                 |
| 4                        | 2, 2, 2                | 6                 |
| 3                        | 2, 1, 1                | 4                 |
| 3                        | 2, 2, 2                | 6                 |
| 4                        | 1, 2, 1, 1             | 5                 |
| 3                        | 1, 2, 1, 1             | 5                 |
| 3                        | 3, 1, 2                | 6                 |
| 3                        | 2, 2, 1                | 5                 |
| 3                        | 1, 2, 1                | 4                 |
| 3                        | 2, 3, 1                | 6                 |
| 3                        | 2, 2, 1                | 5                 |
| 2                        | 2, 1, 2                | 5                 |
| 3                        | 2, 2, 2                | 6                 |
| 4                        | 1, 2, 2, 1             | 6                 |

#### Table 14: Quantity of medicated fluid intake and output

| Quantity of fluid | Mean |
|-------------------|------|
| Maximum intake in ml | 2500 | 1486 |
| Maximum output in ml | 1700 | 879.33 |

![Chart 2: Line diagram showing the quantity of vomitus in various bouts](image)

![Chart 3: Line diagram showing the quantity of medicated fluid intake and output](image)
RBCs: Absent
WBCs: Absent
Epithelial cells: Absent
Parasites: Absent

Table 15: Upadras observed at the end of Vamana in volunteers

| Upadra (complications) | No. of subjects | Percentage |
|------------------------|----------------|------------|
| No                     | 29             | 96.7       |
| Yes                    | 1              | 3.3        |
| Total                  | 30             | 100.0      |

Samyak Shuddhi Lakshanas as observed in the volunteers after Vamana:
1. Vatanulomana (passage of flatus)
2. Lightness of precordium
3. Lightness of the body
4. Happiness
5. Weakness

In 23.3% of the volunteers, all the above five Lakshanas were observed after Vamana. In 33.3% of volunteers, four of these Lakshanas were present. In rest of the volunteers, two to three of these Lakshanas were observed. Vatanulomana (passage of flatus) and lightness of the body were the most common Lakshanas observed in the volunteers after Vamana [Table 15].

In the present study, only one volunteer developed Bhrama (giddiness). No other complications were observed as such.

Discussion

Pārēchakarma procedures are in vogue since the practice of Ayurveda. With the changes in Ahara, Agni, Balā and Vayyama Shakti of the individuals in modern times, it has been important to validate the procedures. The present study was carried out on 30 apparently healthy volunteers, between the age group of 18 to 60 years to observe the Vamana procedure.

Volunteers with lactose intolerance were excluded as milk was used in this study. The pregnant and lactating mothers were also excluded from the study because of physiological variations and specified do’s and don’ts for them.

It was planned to give Sneha pana in increasing doses (50 ml, 100 ml, 150 ml and so on) till the appearance of Samyak Snigdha Lakshanas (i.e. fats in the stool). However, no volunteer was forced to take ghee as per the decided schedule as some of them had to stop Sneha pana or reduce its doses due to symptoms of nausea, heaviness or loss of appetite. No volunteer could tolerate Sneha pana beyond three days. Ghee was given with Daliya or milk in the morning since none of the volunteers was ready to take ghee only (Accha Sneha pana) in this study area. Bhyā Sneha (Abhyanga) with Mahanarayan Taila (the common Vatahara oil) was given for 15-20 min and Shvedana (plain steam bath) was given for 10-15 min (as per the tolerance of the patients).

The volunteers were advised to remain empty stomach on the morning of the Vamana day. Very few volunteers who were having Sukumara Prakriti or could not withstand hunger were allowed to take 100 ml of milk in the morning.

As observed in this study, maximum time taken to consume fluid was 15 min, maximum time required for initiation of Vamana procedure after fluid intake was 10.45 min and maximum duration of expelling vomitus was 31 min. In maximum number of volunteers, the Vamana procedure was Pīttanta (ending with bilious vomitus) which shows ideal Vamana as per the texts. However, in some volunteers (where Kapha accumulation or Kapha obstruction was more) - it was Kaphanta. The Vamana Vegas ranged from 4 to 8 in number.

Quantity of medicated fluid intake ranged from 800 ml minimum to 2500 ml maximum (average 1486 ml). Quantity of total fluid output ranged from 250 ml minimum to 1700 ml maximum (average 879.33 ml). Total quantity of the fluid expelled was lesser than the total quantity of fluid taken. This is because the maximum volunteers were empty stomach. When the volunteer is administered fluid for Vamana, part of it is digested and absorbed from the gut. Only the fluid which is more than the digestive capacity or which is causing extra stress on GIT is expelled out. However, due to variations in reverse peristalsis and force of ejection during bouts, the intake output ratio varies from person to person.

Examination of vomitus included macroscopic, microscopic and chemical examinations.

Under the macroscopic examination, colour, consistency, pH, specific gravity, presence of mucus and blood were examined in the vomitus. The colour of the vomitus was found whitish (due to milk) in first bout and yellowish (bile mixed) in subsequent bouts. The vomitus was initially clear, but precipitated after standing due to milk caseine. The pH of the vomitus was found to be 6 to 6.5. (the acidic pH neutralized up to some extent by milk). Specific gravity of the vomitus was found to be 1.025 to 1.050. Mucus was present in almost all bouts, especially in first and second bouts. Blood was not present in any of the samples. The microscopic examination of the vomitus was done for presence of RBCs, WBCs, epithelial cells and parasites which were found absent in all the samples.

The chemical examination of vomitus was done for bile salts, bile pigments and proteins. Bile salts were present in all the samples. Bile pigments were detected in some samples. Proteins in vomitus ranged from 10 to 30 mg/dl.

As per the texts, the Samyak Shuddhi Lakshanas as observed in the volunteers after Vamana were-
- Vatanulomana (passage of flatus)
- Lightness of precordium
- Lightness of the body
- Happiness
- Weakness

In 56.6% of the volunteers, 4 to 5 Lakshanas were observed after Vamana.

In the present study, only one volunteer developed Bhrama (giddiness) in whom there was a fall in serum electrolyte levels; however with ORS for two days, the symptom was settled. No other complications were observed as such in other volunteers.

Volunteers were given Shikanji after 1 h of Vamana (oral rehydration solution) followed by thin Khichari (rice and moong dal) and then thick Khichari or Daliya (as per the choice of the volunteers).
Shikanji and Khichari were the maximum accepted and well-digested diet after Vamana. Maximum volunteers preferred Samvarjana Krama of shorter duration i.e. 24 h (2-3 Ahara Kalas).

The samshodhana Chikitsa (bio-cleansing therapy) of Ayurveda, which includes Panchakarma treatment, basically intends to eliminate the toxic elements from the body and thereby enhances the immunity of the body. The toxic products of body metabolism can be broadly divided into water soluble, fat soluble and volatile substances. The volatile substances like carbon dioxide can easily be removed from the body through lungs. While there are number of mechanisms available to get rid of the water soluble toxic materials through kidney, sweat and other body secretions, removal of fat-soluble toxic materials is very difficult and only liver can play a small role. Hence it is likely that, there would be accumulation of fat-soluble toxic products in the body. Liberal use of oil and ghee in various Panchakarma procedures makes it possible to eliminate these fat soluble toxic products. In modern day medicine, we understand that molecules move from higher concentration to lower concentration when separated by a diffusable membrane. The skin and the mucus membrane provide an excellent opportunity for this manoeuvre. While skin of an average adult only provides a surface area of less than 2 m², the gastrointestinal tract is many meters long with a highly permeable mucus membrane. The mucus membrane of gut has many folds and projections in the form of villi and microvilli, which help to increase the total exchange area, equivalent to a tennis court. Various Panchakarma procedures like Vamana (therapeutic emesis), Virechana (therapeutic purgation) and Anuvasana (medicated oil enema) use oil liberally, thereby removing toxic fat-soluble waste materials. Prior to the five Pradhana Karmas (main procedures), Svedana procedure using hot steam increases the local skin blood flow, thereby enhancing the exchange process. The Ayurvedic medicines added to the oil might give additional benefits.

Conclusion

Thus Vamana is a safe Panchakarma procedure when undertaken methodically. It is a bio-cleansing process which probably eliminates fat soluble toxic substances from the body. In modern era with modified dietary habits, the procedure needs to be revalidated. For the present observational study, Vamana procedure was given to healthy volunteers after Pororakarmas. The volunteers’ maximum ghee consumption for Snehatapa was found to be 50 ml, 100 ml and 150 ml for day I, day II and day III respectively. Maximum time taken to consume fluid was 15 min, maximum time required for initiation of Vamana procedure after fluid intake was 10.45 min and maximum duration of expelling vomitus was 31 min in the present study. Number of veggies ranged from 4 to 8 in this study. Regarding Antiki Shuddhi, maximum volunteers (66.7%) showed Pittanta Vamana. Maximum quantity of medicated fluid intake was 2500 ml (average 1486 ml); however, maximum quantity of total fluid output was 1700 ml (average 879.33 ml). Total quantity of the fluid expelled was lesser than the total quantity of fluid intake due to absorption of some fluid by gut.

Examination of vomitus included macroscopic, microscopic and chemical examinations. The colour of the vomitus was whitish and yellowish, initially clear, but precipitated after standing, with pH 6 to 6.5 and specific gravity 1.025 to 1.050. Mucus was present in almost all bouts. In the microscopic examination of the vomitus, RBCs, WBCs, epithelial cells and parasites were found absent in all the samples. In chemical examination of vomitus, bile salts and bile pigments were detected. Proteins in vomitus ranged from 10 to 30 mg/dl.

Only one volunteer developed Bhrama (giddiness) as Upadrava, in whom there was a fall in serum electrolyte level, and it was managed with ORS. Most of the volunteers showed Samyak shuddhi Lakshanas as - Vatanulomana (passage of flatus), lightness of precordium, lightness of the body, Manaahprasada (happiness) and weakness. Shikanji and Khichari was the maximum accepted and well-digested diet after Vamana. Maximum volunteers preferred Samvarjana Krama of shorter duration i.e. 24 hs (3 Ahara Kalas).

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