

Wipeout period of spinal anesthesia in hemorrhoidectomy in relation to *Prakriti*: An observational study

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Abstract

Background: A maximum number of hemorrhoidectomies are performed under spinal anesthesia. However, the effect of spinal anesthesia varies from person to person due to difference in their physical and psychological properties, which is well explained in Ayurveda as *Prakriti* (physiology of an individual). In this study, we have tried to establish a relation between wipeout period of spinal anesthesia and different *Prakriti*. **Objectives:** To observe wipeout period of spinal anesthesia in hemorrhoidectomy in relation to different *Prakriti*. **Materials and Methods:** A total of 30 individuals who underwent hemorrhoidectomy under spinal anesthesia were selected for the study and their *Prakriti* was assessed as per the standard *Prakriti* assessment chart before surgery. Apart from demographic data, pain assessment was also recorded by following visual analog scale. Postoperative follow-up was done until the wipeout effect of spinal anesthesia was observed. GraphPad Prism software was used to analyze the data; $P < 0.05$ was considered statistically significant. **Results:** Male predominance was observed in hemorrhoidectomy cases. Majority of the patients were 20–25 years of age with body weight between 61 and 70 kg. Distribution of *Prakriti* was observed to be highest in *Vata-Pitta Prakriti* (36.6%). A significant difference was observed in the wipeout period among *Prakriti* where the duration of wipeout period was more in the *Kapha Prakriti* individuals ($P < 0.0001$). **Conclusion:** *Kapha* involvement increases the wipeout period in posthemorrhoidectomy; however, in *Pitta* and *Vata Prakriti* individuals, the wipeout period is less. Future studies could include a larger sample size and various other factors to analyze the involvement of *Kapha*.

Keywords: Hemorrhoidectomy, *Prakriti*, spinal anesthesia, wipeout period

Introduction

Arsha (hemorrhoids) are the protruding, inflamed blood vessels in a distention state around the rectum, which strike in 39%–52% of the elderly population.^[1] These are usually asymptomatic, but may complicate with the painless hemorrhage with prolapsed, pruritus anus and usually pain if thrombosed. Risk factors are poorly understood, but it is hypothesized that risk amplifies on inadequate dietary fiber intake, straining during laxation and constipation.^[1,2] Open hemorrhoidectomy is an extensively used surgical procedure for the clinical management of hemorrhoids.^[3,4] Surgery contributes to massive pain postoperatively by virtue of spinal anesthesia usage^[4] because anesthesia along with disrupting neural conductivity by blocking the inflow of sodium ions gives rise to transient neurological symptoms.^[5,6] However, patients behave differently with the same anesthetic even with the adoption of uniform technique and surgical procedure. This uncertainty is believed to be due to the physical and

psychological status of the patient, referred to as *Prakriti* in Ayurveda. *Prakriti* is a basic term in Ayurveda which defines a physical and psychological feature of human beings.^[7] Being an ancient scheme of medicine practiced in India, Ayurveda achieved a global appreciation for its successful practice and attained superiority in research and complementary medicine development,^[8] it proposes that *Prakriti*, *Dosha* (bioelements), and *Agni* (metabolism) are central paradigms of proper health and disease development. In holistic approach, Ayurveda classifies human beings based on the seven different *Sharirika Prakriti*, namely, *Vata*, *Pitta*, *Kapha*, *Vata-Pitta*, *Pitta-Kapha*, *Kapha-Vata* and *Tridosha-Vata Pitta Kapha* people corresponding to three *Dosha-Vata*, *Pitta* and *Kapha*,

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Access this article online

Quick Response Code:



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DOI:
10.4103/ayu.AYU_43_17

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How to cite this article: Shindhe PS, Pandey SK, Killedar R. Wipeout period of spinal anesthesia in hemorrhoidectomy in relation to *Prakriti*: An observational study. *Ayu* 2017;38:113-6.

which are collectively known as *Tridosha*.^[9,10] *Vata* is comprised *Akasha* and *Vayu Mahabhuta* which recognizes input and output functions; *Pitta* composed of *Agni* (metabolism) regulates energy balance, digestion and metabolism and *Kapha* with *Prithvi Mahabhuta* implies on cohesion, structure, and lubrication.^[11] All these three *Dosha* have their own phenotypic characteristics corresponding to certain factors such as season, diet, age and activity.^[10] Imbalance in these three dynamic *Dosha* causes disease and with directly linked symptoms.^[9] Each *Dosha* has particular qualities (*Guna*) that reflect specific physical as well as psychological expressions. Each individual possesses specific constitution (*Prakriti*), which implies for the individual physical, psychological, and functional (*Dosha*) status and can be assessed by classifying the dominance of one or more *Dosha* on the period of conception.^[12] *Prakriti* is particular and specific to each individual, which is determined during fertilization and remains unchanged for lifetime.^[12,13] *Prakriti* of an individual is characterized by particular *Dosha* and their predominance and believed that environmental factors may also influence it.^[14] Specific expression of *Prakriti* and its response to standard treatment would not produce a uniform response in all the patients. *Prakriti* assessment plays a significant role in the diagnosis of diseases based on physical and psychological characteristics in Ayurvedic way of approach.^[14]

Spinal anesthesia comprises lidocaine, an analgesic of amide group which is extensively used in various medical treatments such as antiarrhythmic therapy, which is responsible for implicating transient neurological symptoms such as pain. Even though the amount of drug lidocaine is same (5%) in all the patients, spinal anesthesia usage varies the time of postoperative pain from person to person. This uncertainty in clinical postoperative pain led this study to find out a definite relationship regarding the wipeout period of spinal anesthesia. This study of spinal anesthesia relation to *Prakriti* is carried out to find the physiological and psychological relationship that is occurred in the three categories of people: *Vata*, *Pitta*, and *Kapha* predominant.

Materials and Methods

This was an 18-month observational study performed at Ayurveda Mahavidyalaya, KLE University, Belagavi. A total of 30 patients were included in the study who had undergone hemorrhoidectomy under spinal anesthesia. Patients falling under grade I and II of the American Society of Anesthesiologists with the age between 20 and 50 years were selected for the study. Patients on antidepressant and antipsychotic drugs and patients suffering from bronchial asthma, cardiac diseases, renal failure, diabetes, hypertension, and addictions were excluded from the study. *Prakriti* of the patients was assessed as per the standard *Prakriti* assessment proforma by the CCRAS.^[15] Pain was assessed using visual analog scale till wipeout effect of spinal anesthesia. This study was ethically cleared by the Institutional Ethics Committee (Reference No: BMK/12/PG/SH/11) for human

subjects and obtained written informed consent form from all the patients willing to participate in this study. GraphPad Prism software was used to analyze the data. $P < 0.05$ was considered statistically significant data.

Results

A total of 30 patients undergoing hemorrhoidectomy were observed in this study in relation to *Prakriti*. The patients were observed for wipeout period of spinal anesthesia.

Age, weight, and sex

In the present study, 23.3% of patients were in the age group of 20–25 years followed by 20% in 36–40 years and 46–50 years age group and 13.3% were in the age group of 31–35 years and 41–45 years. Remaining 10% of patients belonged to the age group of 26–30 years.

Weight-wise distribution showed that 43.3% of patients were in the weight group of 61–70 kg and 23.3% of patients were in the weight group of 40–50 kg and 51–60 kg where 9.9% were in the weight group of 71–80 kg. Sex-wise distribution showed that 70% of patients were male and 30% were female.

Prakriti

Prakriti-wise distribution showed that 36.6% of patients belonged to *Vata-Pitta Prakriti* followed by *Vata-Kapha Prakriti* (20%), *Pitta-Kapha Prakriti* (16.6%), *Pitta-Vata Prakriti* and *Kapha-Pitta Prakriti* (10%) [Table 1].

Wipeout period

Highest wipeout period was observed in *Vata-Kapha* (253.3 + 12.5) followed by *Kapha-Pitta* with moderate wipeout period. The mean value of *Vata-Kapha*, *Kapha-Pitta* and *Pitta-Kapha* was 253.3, 228.7 and 205 respectively [Table 2].

Table 1: Distributions of *Prakriti* among patients

Types of <i>Prakriti</i>	Number of patients, n (%)
VP	11 (36.6)
VK	6 (20)
KP	3 (10)
PK	5 (16.6)
PV	5 (16.6)

VP: *Vata-Pitta*, VK: *Vata-Kapha*, KP: *Kapha-Pitta*, PK: *Pitta-Kapha*, PV: *Pitta-Vata*

Table 2: Mean ± standard deviation of wipeout duration for hemorrhoidectomy

<i>Prakriti</i>	Duration (min), mean ± SD
VP (n=11)	161.8±12.3
VK (n=6)	253.3±12.52
PK (n=5)	205±14.58
PV (n=5)	178.8±14.13
KP (n=3)	228.7±35.64

SD: Standard deviation, VP: *Vata-Pitta*, VK: *Vata-Kapha*, PK: *Pitta-Kapha*, PV: *Pitta-Vata*, KP: *Kapha-Pitta*

One-way analysis of variance concerning wipeout duration and *Prakriti* showed a significant difference between *Vata-Pitta* and *Vata-Kapha*, *Vata-Pitta* and *Pitta-Kapha*, *Vata-Pitta* and *Kapha-Pitta*, *Vata-Kapha* and *Pitta-Kapha*, *Vata-Kapha* and *Pitta-Vata*, and *Pitta-Vata* and *Kapha-Pitta*. No significant difference was observed between *Vata-Pitta* and *Pitta-Vata*, *Vata-Kapha* and *Kapha-Pitta*, *Pitta-Kapha* and *Kapha-Pitta*, and *Pitta-Kapha* and *Pitta-Vata* [Table 3].

No significant difference was observed between age and weight of the patients on the wipeout period. This shows that there was no correlation between age groups and weight of the patients on wipeout period.

Discussion

The present study was conducted to determine the role of the *Prakriti* in the differences observed in the wipeout period in hemorrhoidectomy surgery by spinal anesthesia. Hemorrhoidectomy is generally observed in the geriatric patients as stated by previous studies. Contrastingly, the present study observed the patients from age group of 20–25 years dominating the incidence of hemorrhoidectomy.^[1] Postoperative, spinal anesthesia-related complications such as acute urinary retention, irrepressible pain and increased necessity of analgesia and transient neurological symptoms may be because of the presence of lidocaine.^[16,17] Ninety percent of lidocaine gets metabolized rapidly in liver by CYP3A cytochrome and give rise to certain active metabolites such as monoethylglycinexylidide and glycinexylidide with half-life up to 10 h, and only <10% of nonmetabolized lidocaine is excreted out by kidney.^[18,19] The plasma binding of lidocaine depends on drug concentration and metabolism, where binding decreases with increase in concentration,^[20,21] suggests that if drug metabolism is fast, clearance (wipeout) period will be lesser.

Major constitutions of human being such as *Vata*, *Pitta* and *Kapha* possess distinct variety of metabolic behavior. *Pitta* is characterized with highest metabolic rate, *Kapha* is slower, and *Vata* is with inconsistent property.^[22] Individuals with *Pitta* dominance show higher metabolic rate and digestion. *Agni*, which can also be represented as *Pitta Prakriti*, shows a direct

participation in metabolism, absorption, as well as digestion and assists in the physiological activity of individuals.^[23] *Vata* possesses abnormalcy with *Agni* (*Vishamagni*), but due to the influence of *Pitta*, it raises *Agni*.^[24] In the study, wipeout period is highest in *Vata-Kapha* (253.3 min) followed by *Kapha-Pitta* (228.7 min), *Pitta-Kapha* (205 min), *Pitta-Vata* (178.8 min) and *Vata-Pitta* (161.8 min). These findings denote *Pitta* dominance. The least wipeout period was observed in *Vata-Pitta* with wipeout period of 161.8 min; this may be due to the association of *Vata* and *Pitta*. *Pitta* increases *Agni* and *Vata* also facilitates digestive fire and involves in the continuous circulation of processed food all over the body through micro and macrochannels (*Srotas*)^[25,26] and association of these *Vata* and *Pitta* contributes to enhanced metabolism and digestion leading to lesser wipeout period.

Higher wipeout period was encountered with *Kapha Prakriti*, as *Agni* is weak (*Mandagni*) in *Kapha Dosh*a and develops difficulty in digestion and metabolism.^[8,24] Furthermore, *Agni* is irregular with *Vata* and gets suppressed due to the influence of *Kapha*^[23] leading to lesser metabolism of drug and hence highest wipeout period. This suggests that *Vishama Agni* in *Vata* acts based on *Dosha*. If it is associated with *Pitta*, it increases *Agni* and with *Kapha* it decreases *Agni*, hence changing the wipeout period. Subsequent wipeout period groups were 228.7 and 205 min concerning to *Kapha-Pitta* and *Pitta-kapha* groups, respectively. Wipeout period is less because the *Pitta* is suppressed by *Kapha*; hence, metabolism is lowest so wipeout period is moderate.

In study by Ghodke *et al.*'s^[22] study, significant association was observed between CYP2C₁₉ genotype and major classes of *Prakriti* types. The extensive metabolizer genotype was found to be predominant only in *Pitta Prakriti* and the poor metabolizer genotype was highest in *Kapha Prakriti*.

Conclusion

The present study has revealed that wipeout period of drug, which is used in this study, was fast in *Vataja* and *Pittaja Prakriti* and slow in *Kaphaja Prakriti*. The descriptions in Ayurveda indicate that individuals with *Pitta Prakriti* are

Table 3: One-way analysis of variance for wipeout duration and *Prakriti*

Tukey's multiple comparison test	Mean difference	q	Significant P<0.05	Summary	95% CI of difference
VP versus VK	-91.52	15.83	Yes	***	-115.5--67.49
VP versus PK	-43.18	7.029	Yes	***	-68.71--17.65
VP versus PV	-16.98	2.764	No	NS	-42.51-8.545
VP versus KP	-66.85	9.011	Yes	***	-97.68--36.02
VK versus PK	48.33	7.008	Yes	***	19.67-76.99
VK versus PV	74.53	10.81	Yes	***	45.87-103.2
VK versus KP	24.67	3.063	No	NS	-8.800-58.13
PK versus PV	26.2	3.637	No	NS	-3.733-56.13
PK versus KP	-23.67	2.845	No	NS	-58.23-10.90
PV versus KP	-49.87	5.995	Yes	**	-84.43--15.30

PK: *Pitta-Kapha*, PV: *Pitta-Vata*, KP: *Kapha-Pitta*, VP: *Vata-Pitta*, VK: *Vata-Kapha*, NS: Nonsignificant, CI: Confidence interval, significant value:

*** = <0.0001, ** = <0.001

fast metabolizers and while those of *Kapha Prakriti* are slow metabolizers, which may be comprehended to the extent. Further research is required in large sample size with other anesthetic drugs to understand the relation of wipeout period with *Prakriti*.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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