Part I: Kumbhaka Pranayama
Part II: The immediate effect of Nadishuddhi Pranayam in Heart Rate Coherence and Random Event Generator

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ABSTRACT

Part I: Kumbhaka Pranayama

The aims and objectives of this literature study is to recognize the different techniques, precautions, treatments given by the ancient people through the adaptation of *kumbhaka* in *Präëäyäma* for various health problems and to find a scientific base for it. In today's materialistic world health hazards has become a major issue. The pollution in the present state of life has increased causing many health problems physically and mentally.The need of the hour is to train proper way of breathing. Importance of breathing and its variations to be made understood which is the base of a good, sound, healthy, mind and a body. Training proper breathing with inclusions of right retention methods is essential.

CONCLUSION

The science of *Präëäyäma* is based on the retention of *präëä* called *'kumbhaka'.* Inhalation and exhalation are merely incidental. Those who are serious in awakening the hidden recesses of the brain need to perfect the art of retention (*kumbhaka*). During *kumbhaka* there is an increased blood flow into the brain and simultaneously heat is generated in the system.The heat generates an increased energy in an electrical form. This electrical spark alters the chemical structure of the cerebral fluid which surrounds the brain. When this fluid is chemically influenced, it affects the behavior of the brain. This is why one experiences dizziness. In the practise of *Kumbhaka*, or breath retention, which may be*antar* (internal) or *bahir* (external), tolerance to starvation of oxygen and buildup of carbon dioxide is achieved. *Kumbhaka*, practised over duration of time, will allow the body to retain carbon dioxide and become accustomed to reduced oxygen levels to achieve hypo metabolism, that is, a slowing down of the metabolic

rate. The production rate of carbon dioxide is thereby reduced which causes a subtle effect to take place with conscious control of breathing. This effect influences the brain and body chemistry and reduces the need to breathe when carbon dioxide buildup is experienced. External*kumbhaka* also affects the body physiologically by causing the mental process to stop, because of the vacuum created inside the body. This action is very useful in the practise of *pratyahara*, sense withdrawal, and *dharaëä*, concentration, as a prerequisite to achieve the state of meditation. Therefore, the practise of *Präëäyäma* has to be done very intelligently and patiently.

Part II: The immediate effect of Nadishuddhi Pranayam in Heart Rate Coherence and Random Event Generator

Objective The present study is an attempt to evaluate the immediate effect of nadishuddhi pranayama in normal subjects on heart rhythm coherence (HRC) and random event generator (REG).

Methods

After taking signed consent, 50 volunteers (male and female) in the age range between 17-35 years, who had practiced nadishuddhi pranayama for a minimum of two weeks, were recruited for a self as control study .The measurements were taken before (5 minutes), during (10minutes),after(5minutes)the practice of nadishuddhi pranayama session and breath awareness (control session) on consecutive days.

Intervention

Alternate nostril breathing with awareness (experimental) and breath awareness (control) were used for the two sessions.

Outcome measures

HRC was recorded using the software Freezer framer version 2.0. The pulse is viewed through the finger plethysmogram followed by spectral analysis of RR interval frequencies and computed to depict the coherence scores as bars for low, medium and high coherences.

REG

This microelectronic REG unit generates random events using a solid state diode and depicts it as a curve fluctuating within a parabola of 2 standard deviations. If the will or the presence of a person makes this curve move

beyond the parabola (mean of <99 or >101.00), it indicates a distinct capacity of psycho-kinesis.

Results

RMANOVA for between group analysis showed a significant reduction in the low coherence scores at $p < 0.05$ and increase in high coherence scores ($p=0.001$) during nadishuddhi as compared to breath awareness practice. There was no influence on REG.

SUMMARY AND CONCLUSIONS

Nadishuddhi pranayama practice increases autonomic stability

1. This study was aimed to determine the effect of nadishuddhi pranayama on autonomic variables and psycho-physiological status by assessing Heart rhythm coherence and Random event generator on 50 male and female volunteers at SVYASA, Bangalore.
2. In the Design self as control both male and female volunteers were taken into the practice of nadishuddhi pranayama and breath awareness on two different days.
3. The mean age of male (n=27) was 24.44±3.90 and the mean age of female (n=23) was 25.04±4.66. The breath awareness and nadishuddhi pranayama practice was done without any instruction for the duration of 10 minutes.
4. The heart rhythm coherence was measured using the Freeze Framer Version 2.0 Interactive learning system with heart rhythm monitor, along with Random event generator.
5. The results showed that there was a significant difference in the pre values of low HRC between the two practices nadishuddhi pranayama and breath awareness ($p=0.001$) There are highly significant differences at 10, 15, 20 minutes between the two practices but none at the 5th minute.
6. For nadishuddhi pranayama there is no difference between 10th and the 20thminute. For breath awareness the only significant difference is5-10 10-15 15-20th minute
7. HRC medium shows no overall difference between the nadishuddhi practice and breath awareness practice groups. HRC high shows highly significant difference between the two groups ($p<0.001$) .From the two practices, it was observed that there were highly significant differences

at 10, 15, 20th minute but none at 5th minute. For nadishuddhi pranayama there is no difference between the 10th and 20th minute. In Random event generator there was no significant difference found between the two practices.

8. It is suggested that the nadishuddhi pranayama was beneficial for the chosen subjects; further study on larger population and the longer period of follow up is necessary to get the desired results.

Keywords: Nadishuddhi pranayama, Heart rhythm coherence, Random event generator.