Efficacy of olfaction vs oral route of administration in acute diseases: Pilot study

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Abstract
Over the years, the oral route has been the preferred way of taking medication. There are cases in children and coma patients where olfaction is required, and Hahnemann is well aware that patients are advised to smell in many situations. Medication given this way usually works faster. The olfactory experience is subjective and the olfactory nerves are specific. Based on inclusion and exclusion criteria volunteers were selected and divided into 2 groups of oral and olfaction of 15 matched patients. Potency of remedy was based on totality of symptoms and susceptibility and according to the need of the patient, repetition was also done. Time taken for drug action and improvement of condition considered and recorded for adaptability. Data obtained statistically analyzed. The results thus obtained explain the benefit of olfaction over oral route of administration of the drug.

Keywords: Olfaction, alternative route, route of administration, oral route, clinical homeopathic medicine, rapid action

1. Introduction
Commonest route of administration is oral. Though, clinically there are cases of olfaction being effective. Olfaction is preferred only in epilepsy, coma and children who refused to take medicines orally (spits out) and also an excellent mode while the child is asleep [6; 7]. Odor stimuli are incredibly dynamic [8]. An inhaled medication is delivered rapidly across respiratory tract epithelium as well [9]. In recent years, evidence has begun to show the importance of olfaction and the predictive results [10; 11; 12]. Studies have shown the ability to carry drugs directly from the nose to the brain and compared to intravenous injections [13; 14]. Also intranasal delivery has been shown to be delivered non invasively from the nose to the brain within minutes through the olfactory and trigeminal pathways, by passing the blood brain barrier [15].

In 1999, Buck and Axel found olfactory receptor as the largest gene family in the human genome with 418 intact and potentially functional genes which are classified into 18 families, and each family constitute more than 40% sequence identity. Depending on evolutionary data or sequences, class 1 and class 2 are separated into two classes. Class 1 receptors initially resemble family found in aquatic life, so it was suggested that these receptors may specialize in finding water soluble odorants [16]. Olfactory receptors respond to odorant molecules just as most sensory receptors respond to their specific stimuli [17].

Hahnemann have mentioned in 6th edition of Organon of Medicine (§ 288) and in the Materia Medica pura about the effectiveness of olfaction. The action of aconitum in olfaction is mentioned in Hahnemann’s materia medica pura [1; 18; 19; 20]. Samuel Hahnemann recounts events where damaging smells in the environment disrupted homeopathic reaction. Homeopathic response provides examples, showing that remedial action can be successfully restored by timely recurrence of the drug discussing the results on the clinical homeopathy system [21]. It is especially in the form of vapor, which always comes out of a globule rich in medicinal fluid in the development of high potency through the olfactory and respiratory properties of the drug and placed dry in a small bottle, homeopathic remedies work most firmly and vigorously [22].

In accordance with various data available, the ingestion takes about 30-90 minutes to cause the action, whereas inhalation acts in 2-3 minutes. Hence, as per this data, administration of the remedy through inhalation is more in action compared to ingestion of the same remedy [23]. Hence this pilot study was designed to understand and evaluate the rapidity of action [24] of the remedy in comparison between these two routes.
2. Materials and Methods
Ethical committee clearance was obtained from institutional ethical committee, prior to the start of study. Selection of patients was based on inclusion and exclusion criteria of acute cases after obtaining informed consent form signed according to WHO format. The subjects were divided into 2 categories in random. Route of olfaction – category A Route of oral- category B Negative category was not considered with regard to welfare of patients. Each category had a minimum of 15 patients after matching. Drug was administered orally in oral administration category and olfaction in olfactory category of administration. Selection of potency and repetition of the remedy was done according to the need of the patient, symptom totality and susceptibility. Duration for action of medicine and importance of condition was reviewed and recorded for matching. Statistically the data was analyzed by unpaired t test.

3. Inclusion criteria
• Acute illness Exclusion criteria-
• Patients on other medications
• Geriatric cases

4. Results and Discussion
4.1 Observations

Table 1: Duration taken to record significance prognosis in a case

| S.no | Diagnosis       | Oral route (category b) | Action time (min) (approximate) | Olfactory route (category a) | Action time (min) (approximate) |
|------|-----------------|-------------------------|--------------------------------|-----------------------------|---------------------------------|
| 1    | Tonsillitis     | Kali bich 200           | 2880                           | Phytolacca 200              | 4                               |
| 2    | Headache        | Nat mur 200             | 45                             | Belladonna 200              | 2                               |
| 3    | Helminthiasis   | Cina 200                | 1440                           | Aconite 6x                  | 180                             |
| 4    | Headache        | Sangunaria 200          | 2880                           | Nux vomica 200              | 10                              |
| 5    | Tonsillitis     | Ferrum phos 6x          | 180                            | Belladonna 200              | 6                               |
| 6    | Dysmenorrhea    | Chamomilla 200          | 30                             | Arnica 200                  | 5                               |
| 7    | Dysmenorrhea    | Mag phos 200            | 120                            | Bryonia 200                 | 2                               |
| 8    | Gastritis       | Carbo veg 200           | 20                             | Nux vomica 200              | 3                               |
| 9    | Fever           | Belladonna 200          | 30                             | Rhus tox 200                | 15                              |
| 10   | Lumbago         | Kali carb 200           | 10                             | Ruta 200                    | 4                               |
| 11   | Fever           | Belladonna 200          | 360                            | Belladonna 200              | 3                               |
| 12   | Fever with headache | Gelsemium 200       | 1440                           | Nux vomica 200              | 4                               |
| 13   | Aphthous ulcer  | Borax 200               | 90                             | Merc sol 200                | 10                              |
| 14   | Functional dyspepsia | Nux vomica 200       | 30                             | Carbo veg 200               | 5                               |
| 15   | Toothache       | Ferrum phos 200         | 120                            | Staphysagria 200            | 25                              |

4.2 Statistical analysis
The study was initially conducted with the participants of 30, each group of 15. An independent sample t test was conducted to compare and understand the efficacy of olfactory group and oral route of administration. There was a significant difference in the total for olfactory group (Mean=18.53, Standard deviation=45.9) and oral group (Mean=64.5, Standard deviation=1024.69) respectively.

\[ t-value = 2.36555, p-value = .012581 \]

In the cases of olfactory group improvement was observed in a range of 2 minutes -180 minutes and oral group showed improvement in 10 minutes - 2880 minutes. Thus, the results presented with skewness, but p value indicates that the study is statistically significant proving the alternating hypothesis.

5. Conclusion
As the existing literature suggests olfactory group works in 2-3 minutes, our homoeopathic medicines also exhibit significant improvement faster [25] the medicines can be administered through the nose by olfaction as mentioned by Hahnemann [26]. So, the study provides an understanding and observation that patients with altered sensorium responded faster in olfactory route of administration than in oral group. Hence, olfaction is also equally effective and as of oral route used, this can be considered in route of administration in acute diseases.

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7. Reference
1. Samuel Hahnemann. Organon of Medicine Word Index Included. 5th and 6th edition Pharganj, New Delhi: B. Jain Publishers (P) LTD. Reprinted. 2007. 260-263.
2. Le J. Drug Administration - Drugs - MSD Manual Consumer Version [Internet]. MSD Manual Consumer Version. 2021 [cited 22 August 2021]. Available from: https://www.merckmanuals.com/home/drugs/administration-and-kinetics-of-drugs/drug-administration
3. Chae H, Kepple D, Bast W, Murthy V, Koulakov A, Albeau D. Mosaic representations of odors in the input and output layers of the mouse olfactory bulb.
4. Nature Neuroscience [Internet]. 2019;22(8):1306-1317. Available from: https://neurosciencenews.com/quantifying-olfaction-14544/
5. Moini J, Piran P. Olfactory Nerve - an overview | ScienceDirect Topics [Internet]. Sciencedirect.com. 2021 [cited 22 August 2021]. Available from: https://www.sciencedirect.com/topics/neuroscience/olfactory-nerve
6. I Sniff At Homoeopathy. Homoeopathy Plus. 2019. Available here: https://homoeopathyplus.com/i-sniff-at-homoeopathy/

7. Nothing by Mou’th’. Olfaction, Friction, and other Non-Oral Delivery Routes - Ann McKay [Internet]. Hpathy.com. 2021 [cited 22 August 2021]. Available from: https://hpathy.com/homeopathy-papers/%E2%80%9Cnothing-by-mou%E2%80%9D-olfaction-friction-and-other-non-oral-delivery-routes/

8. Olfaction Research | Neuroscience | Aurora Scientific [Internet]. Aurora Scientific. 2021 [cited 22 August 2021]. Available from: https://aurorascientific.com/applications/olfaction/

9. Kim J. Medication routes of administration [Internet]. Stat Pearls [Internet]. U.S. National Library of Medicine; 2021. Available from: https://www.ncbi.nlm.nih.gov/books/NBK568677/

10. Menini A. The neurobiology of olfaction. 1st ed. boca raton: © 2010 by Taylor and Francis Group, LLC.

11. Pierce A, Simons C. Olfactory Adaptation is Dependent on Route of Delivery. Chemical Senses [Internet]. 2018 [cited 22 August 2021]:43(3):197-203. Available from: https://academic.oup.com/chemse/article/43/3/197/4833178

12. Vinayak Pathak. Nasal delivery - a promising route of drug delivery to the Brain: Scientific Considerations [Internet]. Drug Development and Delivery. 2018 Drug Development & Delivery, 2018. Available from: https://drug-dev.com/nasal-delivery-a-promising-route-of-drug-delivery-to-the-brain-scientific-considerations-2/

13. Crowe TP, Greenlee MH, Kanthasamy AG, Hsu WH. Mechanism of intranasal drug delivery directly to the brain. Life Sciences. 2018;195:44-52.

14. Warnken ZN, Smyth HDC, Watts AB, Weitman S, Kuhn JG, Williams RO. Formulation and device design to increase nose to brain drug delivery. Journal of Drug Delivery Science and Technology. 2016;35:213-22.

15. Johnson NJ, Hanson LR, Frey WH II. Trigeminal pathways deliver a low molecular weight drug from the nose to the brain and orofacial structures. Mol. Pharm. 2010;7:884-893.

16. Buffy T. Human olfactory receptor expression and their role in non-olfactory tissues, a mini-review. J Pharmacogenomics Pharmacoproteomics 2015;6:152. Available from: https://docs.google.com/document/d/12Jr6sw7BKUzMStA1-aMZLqZymeV4X6ylcaDi0hWCR0v/edit?usp=sharing-eil&ts=5fa1509a

17. Tortora G, Derrickson B. Principles of anatomy and physiology. 11th ed. Hoboken: John Wiley & Sons; 11th Revised edition (12 September 2007), 2007.

18. Samuel Hahnemann. Materia Medica Pura. Volume 1. Pharganj, New Delhi: B. Jain Publishers (P) LTD. 17th impression, 2013.

19. Sumith Goel. Art and Science of Homoeopathic Pharmacy. Second and enlarged revised edition. Kandern, Germany: IBPP. 2007, 346-389.

20. Mandal and Mandal. A Textbook of Homoeopathic Pharmacy. Kolkata, West Bengal: New Central Book Agency (P) Ltd. Reprinted. 2017, 427-429.

21. McGuigan M. Observations on the effects of odours on the homoeopathic response. Homeopathy. 2014 Jul;103(3):198-202. DOI: 10.1016/j.homp.2014.01.002. PMID: 24931752. Available from: https://pubmed.ncbi.nlm.nih.gov/24931752/