

TITLE: A CLINICAL AND *INVITRO* ASSESSMENT OF HEKLA LAVA 3X IN IMPROVING THE ORAL HYGIENE OF BED RIDDEN PATIENTS AND THEREBY ELEVATE THEIR SENSE OF WELL BEING.

1. INTRODUCTION:-

Oral hygiene is defined as the practice of keeping one's mouth clean and free of diseases and other problems by good oral hygiene practices.⁽¹⁾ A good oral hygiene plays a role in the health of an individual and it can be maintained by practices like brushing the teeth twice a day, flossing, proper usage of a mouthwash and so on. The Global Burden of Disease Study 2017 estimated that oral diseases affect 3.5 billion people worldwide.⁽²⁾ In the case of bedridden patients who are mostly constrained to their rooms and being a lot of times limited to eating and sleeping, the practice of maintaining a good oral hygiene becomes an extra task and hence are prone to many infections of the oral cavity.⁽³⁾

The medicine selected here for the study is a 3X liquid dilution of HEKLA LAVA.

The medicine is originally prepared from the volcanic ashes in the immediate vicinity of Mount Hekla in Iceland and the ash is triturated with lactose sugar to make the tincture⁽⁶⁾. The remedy is typically used for bone disorders, such as Exostosis (benign bony outgrowths) or Osteitis (inflammation of the bone). It is considered particularly suitable for treating Sarcoma (cancer of the connective tissue) and Osteosarcoma (a malignant bone tumor), especially if they occur in the jaw, head, or legs. Glandular swellings, particularly those in the neck, can also be treated with HEKLA LAVA, as can toothaches.⁽⁵⁾ However recently a study was published in the Journal of Pharmaceutical Sciences and Research by Swathi.A.Muralidharan.N.P of Saveetha Dental College and Hospital, Chennai regarding the Antimicrobial activity of HEKLA LAVA and CALENDULA which showed that HEKLA LAVA in combination with CALENDULA powder showed specific antimicrobial actions by producing a zone of inhibition around 16mm by Agar well diffusion method⁽⁶⁾.

**FIG: 1 MEDICINE USED:
HEKLA LAVA 3X**



The aim of this project is to check whether HEKLA LAVA in its 3X potency will be able to showcase definite antimicrobial activity even when not used in combination with any other

medicines in improving the oral hygiene of bed ridden patients who find it difficult to maintain oral health.

2. OBJECTIVES:-

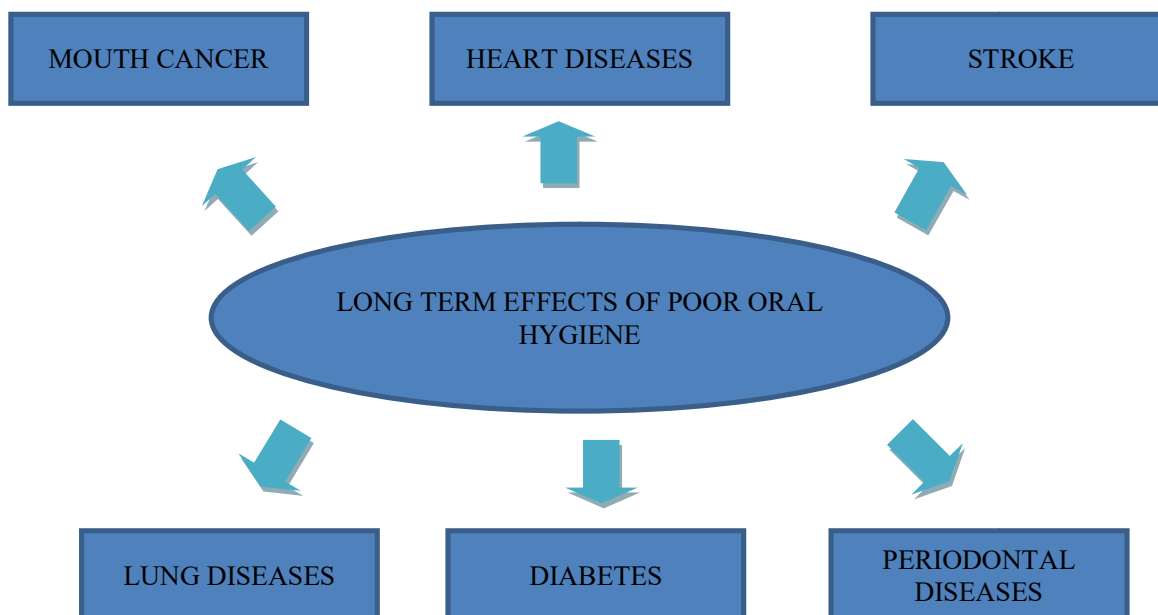
- To check for the effectiveness of HEKLA LAVA 3X in reducing the number of microbes in mouth of bedridden patients and improve the parameters of saliva.
- To demonstrate the effectiveness of HEKLA LAVA 3X by agar overlay method to when cultured with oral swab.

HYPOTHESIS: Hekla lava 3X is effective in improving oral hygiene in bed ridden patients

3.BACKGROUND:-

Oral hygiene is considered to be an integral part of our health and hygiene. Any disturbance to this can not only lead to a state of ill health in patients but can also have long term effects on their mental health as well. Mental and oral hygiene are cyclical in nature where poor oral health can result in social anxieties and self-esteem issues. Studies have shown that poor oral hygiene can have a negative impact on mental illness, and vice versa as it can have an adverse effect on affected individual's physical appearance, self-esteem, and self-image ⁽⁸⁾. Apart from the mental issues faced by these patients, a lack of oral hygiene can also lead to an array of other health related conditions of which are depicted below.

Fig: 2 LONG TERM EFFECTS OF POOR ORAL HYGIENE⁽⁴⁾



A large number of patients admitted into the Pain and Palliative Unit are patients who deal with a lot of oral hygiene issues like halitosis, gum infections and so on which detrimentally affect their physical health in the long run. Studies involving the usage of CALENDULA mother tincture (Q) as a mouthwash have been conducted among ICU patients and its antimicrobial activity have been established. Several other medicines like ECHINACEA, PHYTOLACCA, KREOSOTUM etc, are usually being used against the antimicrobial infections. With this study the medicine of study HEKLA LAVA in its 3X potency is by itself effective against the microbial pathogens or will only showcase their antimicrobial activity when used in combination with CALENDULA Q so that the pharmacological efficiency of another rare medicine is proved.

4. METHODOLOGY:-

The following clinical study is to be conducted among around 20 bed ridden patients of SKHMC hospital in the Pain and Palliative unit. The study is conducted after taking prior consent from the patients involved. A mouthwash was prepared using HEKLA LAVA 3X and employed for conducting this study. HEKLA LAVA in combination with CALENDULA Q is taken as a control and a double blind study is conducted for a time period of around 14 days where the patients are advised to use the mouthwash thrice a day. Along with the investigatory procedures, a questionnaire regarding his emotional status towards his present oral hygiene issues is also taken both prior and after the intervention.

Investigations done for the study:

Agar Overlay Technique:

This technique allows you to produce a homogeneous lawn of bacteria within a thin layer of agar across the surface of a plate. Bacteria are added to a soft top agar (0.75% agar, as opposed to the usual 1.5% for agar plates) which has been melted at 100°C and cooled to 45°C. (Fig: 3)

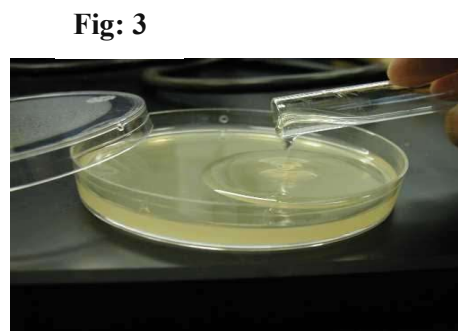


Fig: 3

Biochemical Analysis of Saliva:-

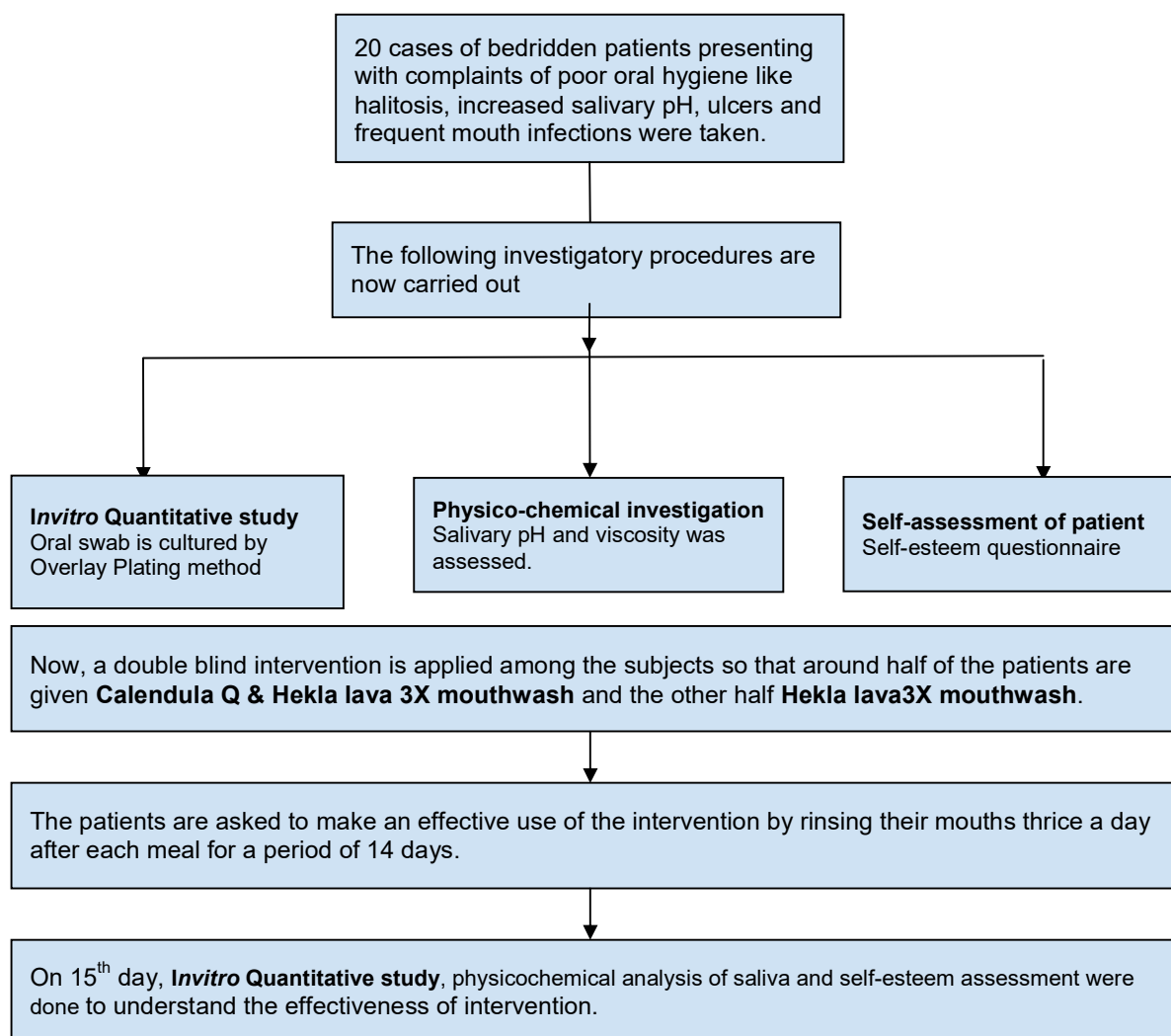
Test to study the pH and viscosity of saliva:- Salivary samples were collected from the patients and their pH was tested using a pH strip. (Fig: 4) Match the color of the pH strip to the color chart to determine the salivary pH levels

(7). The viscosity of saliva was assessed visually.



Fig: 4

Fig: 5 Brief sketch regarding the methodology of study



5. ETHICAL ISSUES: The study involves bedridden patients, they will be given respect, dignity and priority. They will be given complete information regarding the study and enrolled after giving consent.

6. STATISTICAL ANALYSIS: The pre and post microbial count, physical characteristics and score will be compared using t test and Mann Whitney analysis

7. IMPLICATIONS:-

At the end of the study, we are able to check whether HEKLA LAVA acts as an effective antimicrobial agent when used alone or if its effectiveness is only seen when used as a combination remedy with CALENDULA Q

8.REFERENCES:-

- (1)Darby ML, Walsh MM. Procedures Manual to Accompany Dental Hygiene: Theory and Practice. Elsevier Health Sciences; 2009 Apr 1.
- (2) Kassebaum NJ, Smith AG, Bernabé E, Fleming TD, Reynolds AE, Vos T, Murray CJ, Marcenes W, GBD 2015 Oral Health Collaborators. Global, regional, and national prevalence, incidence, and disability-adjusted life years for oral conditions for 195 countries, 1990–2015: a systematic analysis for the global burden of diseases, injuries, and risk factors. *Journal of dental research*. 2017 Apr;96(4):380-7.
- (3) Dye BA. The global burden of oral disease: research and public health significance. *Journal of dental research*. 2017 Apr;96(4):361-3.
- (4) Welbury RR, Thomason JM, Fitzgerald JL, Steen IN, Marshall NJ, Foster HE. Increased prevalence of dental caries and poor oral hygiene in juvenile idiopathic arthritis. *Rheumatology*. 2003 Dec 1;42(12):1445-51.
- (5)BOERICKE’S New Manual of Homoeopathic Materia Medica with Repertory-William Boericke.
- (6)Swathi A, Muralidharan NP. Antimicrobial activity of tooth powder containing Hekla lava and Calendula. *Journal of Pharmaceutical Sciences and Research*. 2015 Oct 1;7(10):882.
- (7)Ranganath LM, Shet RG, Rajesh AG. Saliva: a powerful diagnostic tool for minimal intervention dentistry. *J Contemp Dent Pract*. 2012 Mar 1;13(2):240-5.
- (8) Ohara Y, Iwasaki M, Motokawa K, Hirano H. Preliminary investigation of family caregiver burden and oral care provided to homebound older patients. *Clinical and Experimental Dental Research*. 2021 Mar 8.