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Assessment of improvement of nutritional status with Homoeopathic medicines in malnutrition in children of age group 1-5 years - a crossover study

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Abstract-

Background: Malnutrition is one of the most prevalent chronic health challenges encountered in childhood. The prevalence of this condition is far more than any other diseases encountered in children.

Objectives: With a leading incidence in Udaipur, Rajasthan we intended to seek if this problem could be answered through Homoeopathic constitutional treatment.

Materials and methods: The project took a total duration of 3 yrs to assess 120 malnourished children around the city and villages of Udaipur. Constitutional Homoeopathic medicines with proper diet management and education of parents were advised. Weight was the main anthropometric parameter monitored as primary objectives.

Results: Improvement was noticed in both the case and control group, but it was more significant in case group with time duration. Infections were better controlled in case group or in cross over case group than its other counterpart.

Conclusion: Homoeopathic Treatment was effective in managing the nutritional status of malnourished children aged 1-5 yrs with Z-score between –2SD to –3SD that was not due to dietary deficiency.

Key words- Malnutrition, constitutional Homoeopathic treatment, anthropometric parameter, Z-score.

BACKGROUND-

Malnutrition is the universal public health issue which affects worldwide populations[1]. It can be categorized into under-nutrition (e.g., wasting, stunting, and underweight), over-nutrition (e.g., obesity), and micronutrient-related malnutrition[2]. Globally, about 149 million children are stunted and 50 million are wasted[3]. Under-nutrition has been reported to be accounted for 45% of all child deaths either as a direct or underlying causes[4]. Protein energy malnutrition is mostly caused by insufficient food intake; it can also be secondary, resulting from various illnesses that cause low food intake, insufficient nutrient absorption, elevated nutritional needs, and/or increased nutrient losses[5]. Enough diet and nutrition intake manages primary reasons. Medication is required for secondary instances. It has been shown that the insufficiency quickly reappears when the supplements are withdrawn.

When malnutrition results from the body's incapacity to utilize the nutrients that are available, rather than from a lack of nutrients, this is referred to as a constitutional defect in the body and is recommended to be corrected with medication. In the traditional treatment

approach, sufficient food and nutritional supplements are used to treat mild to moderate instances of malnutrition; in severe cases intravenous fluids, electrolytes, and the proper antibiotics for any subsequent infection are used to treat them[6]. This kind of management is incapable of correcting the constitutional flaw and is short-sighted.

From the Homoeopathic perspective, malnutrition resulting from inadequate nutritional availability and malnutrition resulting from improper absorption are distinct. According to our Materia Medica, nutritional faults can be addressed by homoeopathic remedies. When a person's body cannot absorb nutrients or when a deficiency recurs quickly after stopping supplements, homoeopathy may be appropriate. In both situations, medications are chosen based on the needs of the patient to address fundamental constitutional errors in nutrition, absorption and utilization.

A number of prevalence, epidemiological, socio-demographic and nutritional assessment study on malnutrition was under taken by different researcher.[5,7-15] Ayurvedic researches have revealed the competency of Ayurvedic medicines in crude and combination basis. [16,17]

A study on the efficacy of a Homoeopathic compound used as an adjuvant to treat undernourished children found effective[18]. No such study on individualized Homoeopathic medicines on malnutrition has been conducted by the Central Council for Research in Homeopathy, India.[19,20]

A pilot study conducted by the ML Dhawale trust, Palghar, Maharashtra examined the potential of Homoeopathy in treating malnutrition in children between the ages of one and four has produced encouraging results[21].

A study conducted at Motiwala (National) Homoeopathic Medical College, Nashik comparing the result of individualized homoeopathic medicine and Alfalfa tonic concluded that both group are effective in the management of under nutrition but alfalfa tonic is more effective [22].

Another study conducted at Motiwala (National) Homoeopathic Medical College, Nashik which shows Homoeopathic management and diet is more effective than conventional line of treatment (diet) in increasing weight and mid arm circumference of children suffering from PEM[23].

Homoeopathic studies proved the effectiveness of individualised and formulated medicines but, these studies are pilot studies, RCTs, non-controlled or studies with a less number of sample sizes. Another fact related to malnutrition is confounding factors.

To determine the effectiveness, tailored Homoeopathic research on malnutrition is done with crossover design to overcome the confounding factors. The purpose of this study proposal is to validate it scientifically on the theory that Homoeopathy helps malnourished children to grow and develop normally.

MATERIALS AND METHODS

Study setting-

The study was conducted at Rajasthan Vidyapeeth Homoeopathic Medical College & Hospital, Airport Road, Dabok, Udaipur, Raj.- 313022. Samples were collected from the O.P.D. and Malnutrition O.P.D. of the hospital and from paediatric health check-up camp organized at schools, Anganwadi or villages.

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Selection of samples-

Selection of samples was done by stratified random sampling process. The strata will be comprised of mild and moderate malnourished children. Children having malnutrition assessment of Z-score between –2SD to –3SD and inclusion-exclusion criteria of the child determined their inclusion in the project. Sample size was 60 in each group.

Inclusion / Exclusion and Exit criteria-

Inclusion criteria –

1. Age group between 1-5 years.
2. Both sexes.
3. Undernourished children.
4. Wasted children.
5. Stunted children.
6. Uncomplicated secondary malnutrition not caused due to inadequate food intake.

Exclusion criteria –

1. Primary malnutrition caused due to inadequate food intake.
2. Severe acute malnutrition.
3. Marasmus with complication.
4. Kwashiorkor with complication.
5. Complicated chronic malnutrition.
6. Any autoimmune disease.
7. Any vulnerable patients.
8. Patients with acute medical emergency.
9. Congenital Diseases: ASD, VSD, cleft palate etc.
10. Cystic Fibrosis.
11. Inborn errors of Metabolism.
12. Chronic Renal Failure and Renal tubular Acidosis.

Withdrawal criteria–

1. Children not taking treatment for 4 weeks.
2. Any medical emergency during study.

Study design-

The project was prospective, interventional, double arm, cross-over study.
Firstly, malnourished children were selected as sample and given registration number like 1, 2, 3, 4, 5…….n, then divided into two groups as per odd and even numbers. Both the group was advised for taking adequate food and nutrients along with Homoeopathic medicines as per the repertorial totality for the case group only. Dietary intake as per the guidelines of National Institute of Nutrition was advised to both the group[24]. After 6 months of treatment half of the group was shifted into alternative group to assess for improvements in weight. Pre-scheduled follow ups was decided and dates of visit were fixed as per their enrolment, our team visited the schools to provide the medicine and collect the data.

Data Recording and Analysis-

Data was recorded in authenticated and approved case taking along and follow-up sheet with recordings of rate of infections and mentioned anthropometric parameter.
Data analysis was done under the guidance of a statistician.

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Intervention-

Homoeopathic medicines in different potency like 6CH, 30CH, 200CH, 1M was selected either on the basis of totality of symptoms or constitution of the individual, procured form reputed Homoeopathic medicine manufacturing company for the study.

OBSERVATION-

Laboratory assessment of total sample-

Routine and microscopical examination of urine and stool and complete blood count was done in total 120 samples.

As shown in Fig. 1, mucoid stool, OPC, occult blood, RBC, epithelial cells and mucous cells are present in 38(31.66%), 16(13.33%), 0(0%), 7(5.83%), 15(12.5%) and 27(12.5%) respectively.

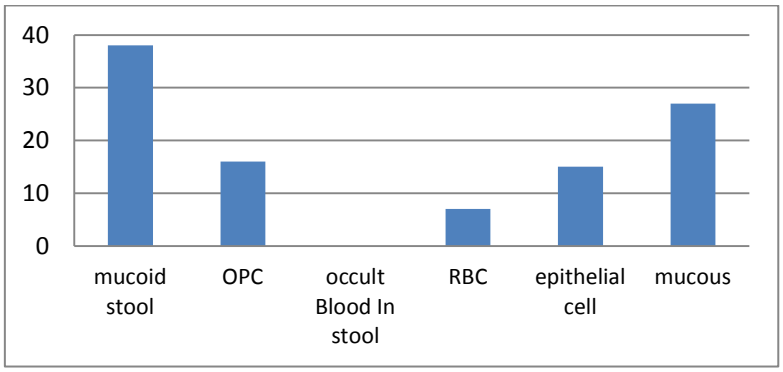

Fig. 1- Routine stool examination

In routine and microscopic urine examination, as shown in Fig. 2, protein, epithelial cells, pus cells, RBC, cast cells and sugar are present in 12(10%), 19(15.83%), 28(23.33%), 7(5.83%), 11(9.16%) and 23(19.16%) respectively.

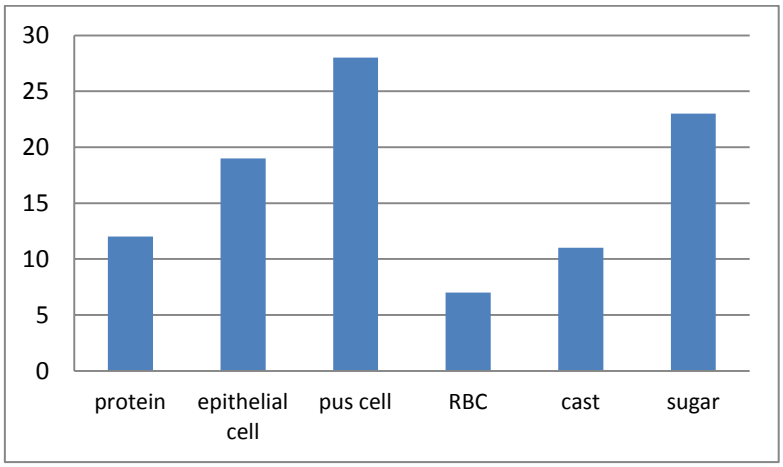

Fig. 2- Urine RE and ME

In Complete blood count, as shown in Fig. 3, reduced Haemoglobin, increased ESR, Leucocytosis, Eosinophilia and Lymphocytosis are present in 33(27.5%), 18(15%), 21(17.5%), 17(14.16%) and 6(5%) respectively.

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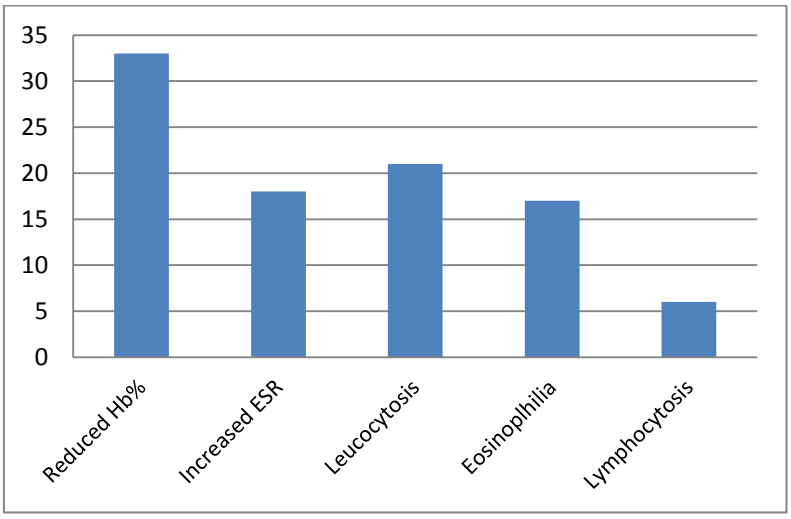


Fig. 3- CBC

Association of different psychiatric conditions in children, as shown in Fig. 4, like ADHD, autism, OCD, anxiety, eating disorder and depression are present in 13(10.83%), 18(15%), 7(5.83%), 28(23.33%), 33(27.5%) and 11(9.16%) respectively.

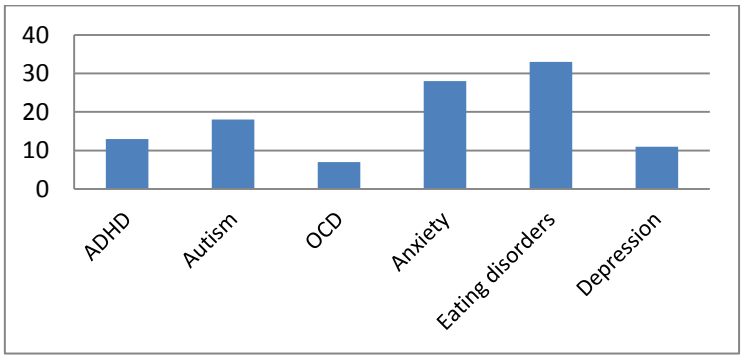
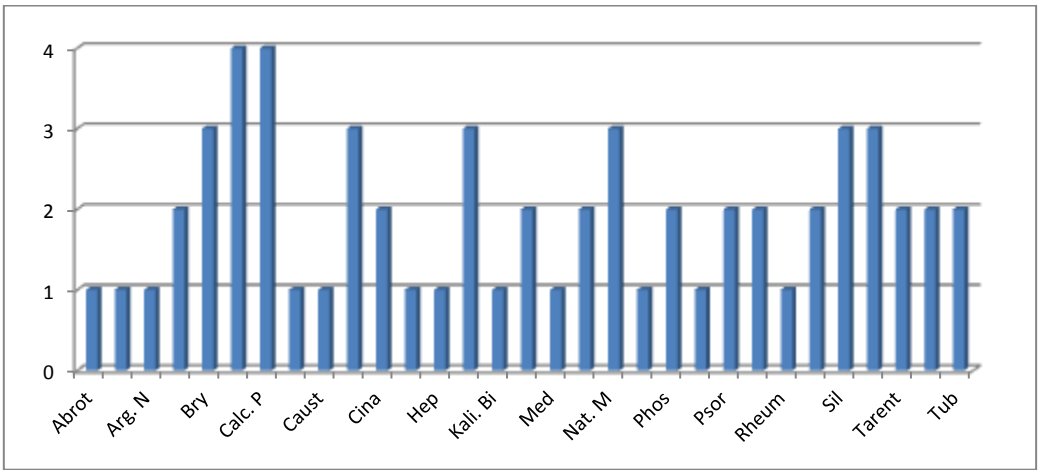


Fig. 4- Association of different psychiatric conditions

Frequency of Homoeopathic similimum in 1st prescription-



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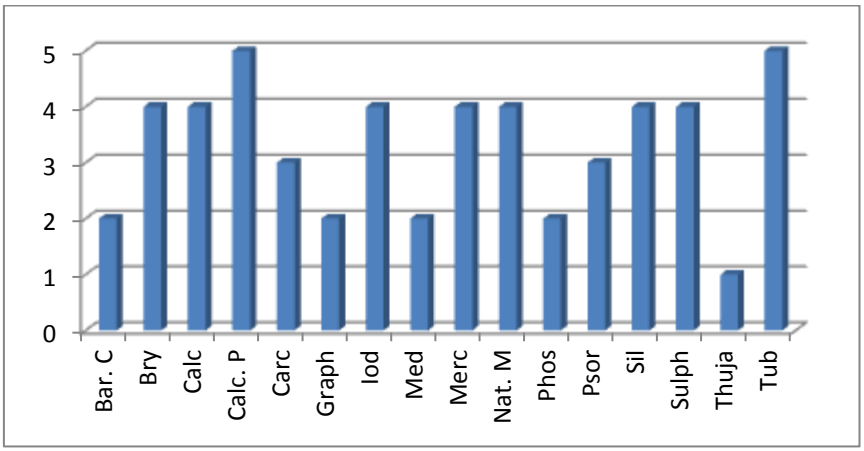
Frequency of Homoeopathic similimum in 2nd prescription-



Analysis and Interpretation of Data collected-

Data analysis- detailed analysis, presentations and interpretation of the research data concerning the improvement of nutritional status of children and assessment of factors associated with malnutrition in children under five years of age was done. The study was guided by the objectives of the study. The data was analyzed using R software latest version 4.3.2 available at https://www.r-project.org and the results were presented in the following tables and figures.

VARIABLES	TIMELINE	MEAN (SD)	MEDIAN	A-D TEST 'P' VALUE	SKEWNESS	KURTOSIS
CASE GROUP WEIGHT	At Baseline	11.74(1.0196)	11.80	0.1707	-0.3006	2.1670
	At 6th Month	12.74 (1.0278)	12.90	0.2891	-0.3512	2.3274
	At 12thMonth	13.21 (0.9720)	13.20	0.1626	-0.2979	2.0739
CONTROL GROUP WEIGHT	At Baseline	12.33(0.8965)	12.55	0.2039	-0.1454	1.8638
	At 6thMonth	13.12 (0.9595)	13.40	0.0978	-0.3590	1.9011
	At 12th Month	13.34 (0.9357)	13.70	0.0168	-0.4705	1.8493

Abbreviations: SD: Standard Deviation, A-D Test: Anderson-Darling Test.
Inference: Since ties are present in the data sets, Anderson-Darling Test (A-D Test) is employed to check whether the data set can be assumed to be normally distributed. If A-D Test P value is more than 0.05, the data set is assumed to be normally distributed and we can proceed for the Paired T test for further statistical analysis. In case the value is less than 0.05, the data set is not normally distributed and one can go for the Wilcoxon Signed Rank Test for further statistical analysis. The results reveal that all the data sets are not normally distributed except one dataset corresponding to the control group weight with the timeline at the 12th month. Appropriate statistical tests are now applied for further statistical analysis.

Table 2: Showing the two side Paired 't' values and calculated p-values

OUTCOME MEASURES	PAIRED 'T' VALUE	CALCULATEDTWO SIDE 'P' VALUE
CASE GROUP WEIGHT		
At 6th Month	-19.442	1.216×10^{-17}(<0.01)
At 12th Month	-28.731	2.524×10^{-24} (<0.01)

Inference: As we can see that the calculated two sided P values of weights of case group data set were <0.01 , it implies that was significant changes between both the pairs –(a) Baseline and 6th month and (b) Baseline and 12th month. From the paired t values, it is also inferred that the weight changes become more significant with time.

Table 3: Showing the two side test values and calculated p- values

OUTCOME MEASURES	TEST	VALUE	CALCULATEDTWO SIDE 'P' VALUE
CONTROL GROUP WEIGHT			
At 6th Month	Paired t-test	-13.921	1.458×10^{-13} (<0.01)
At 12th Month	Wilcoxon signed rank test	32.25	0.000057(<0.01)

Inference: As we can see that the calculated two sided P values of weights of control group data set were <0.01 , it implies that was significant changes between both the pairs –(a) Baseline and 6th month and (b) Baseline and 12th month.

DISCUSSION-

The project intended to find out if constitutional Homoeopathic medicines could help in cases of malnutrition that were not due to primary causes that is dietary deficiencies but were due to some other constitutional errors to assimilate the food by the child. There are several confounding factors to influence nutritional status of a child so to overcome this, the study design was made a cross over one so that the samples of the case and control group were equally exposed and the influence of the confounding factors were same at the time of the project to both groups.

Laboratory investigations focused as parasitic involvement as the most important association with this condition. Malnutrition was seen to be almost equally distributed in rural and urban sites and few of the major factors were dependence and desire of non homemade food for the child, poor nutritional knowledge of parents, tantrums of single child, recurrent infections and few psychiatric problems like ADHD, autism, OCD and anxiety.

Improvement was noticed in both the case and control group, but it was more significant in case group with time duration. One of the major factors was the parent orientation by the volunteers about healthy diet and nutrition on a regular basis. Infections were better controlled in case group or in cross over case group than its other counterpart.

Most frequently prescribed Homoeopathic similimum in Case group or in Crossover case group are Calcarea carbonica, Calc. Phosphorica, followed by Bryonia, Chamomilla, Iodium, Natrum Muriaticum, Silicea, Sanicula, Sulphur, Cina etc. Nosodes like Carcinocin, Medorrhinum, Psorinum, Tuberculinum etc. gave good constitutional healing to the indicated child.

Homoeopathic treatment has a positive role in the management of malnutrition. Detailed study of antenatal history and early childhood provided most of the information that helped in detailed constitutional case taking. Nature of infections and family history provided the knowledge of lurking miasms. Mothers were mainly enquired for the total completion of symptoms of the child along with the observation and examinations of the visiting physicians.

LIMITATIONS AND RECOMMENDATIONS

The constraint of being a single researcher of the study was an important factor for its final analysis as it was done on a relative sample size as compared to the magnitude of the problem. Only one parameter of weight was followed up as there very limited time and opportunity to undergo a detailed anthropometric measurement. Weight was taken as single most effective parameter as the height improvement has other influences like race, genetic factors etc. A large sample size will definitely bring more significant results with Homoeopathic Medicine.

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Conflict of Interest: None declared.

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