



International Journal of Homoeopathic Sciences

E-ISSN: 2616-4493
P-ISSN: 2616-4485
www.homoeopathicjournal.com
IJHS 2022; 6(1): 78-85
Received: 28-10-2021
Accepted: 08-12-2021

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Role of homoeopathic management in the reduction of microalbuminuria of essential hypertension

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DOI: <https://doi.org/10.33545/26164485.2022.v6.i1b.518>

Abstract

Hypertension is the most common risk factor for cardiovascular disease. The effect of elevated blood pressure has increased the death and disability rates in recent years. There is an increase frequency of cardiovascular events in hypertensive patients with microalbuminuria compared to those with normal urine albumin excretion. Microalbuminuria is a marker of target organ damage in hypertension, as it results in functional and structural changes. This study is an attempt to evaluate the role of homoeopathic medicines in reduction of microalbuminuria of essential hypertension.

Objective: To evaluate the role of homoeopathic medicines in lowering Microalbuminuria in patients with Essential Hypertension.

Methods: The study design adopted was quasi experimental prospective, non-randomized without control. Each case was subjected to systolic blood pressure (SBP), diastolic blood pressure (DBP) and Urine albumin excretion (UAE) at baseline, three months after the treatment and six months after the treatment.

Result: All parameters showed significant 'p' values. There was a mean fall of SBP, DBP and Urine albumin level after 6months of homoeopathic treatment.

Conclusion: In this study the Homoeopathic management is found to be effective in reducing the urine microalbumin of essential hypertension.

Keywords: Hypertension, systolic blood pressure, diastolic blood pressure microalbuminuria, homoeopathy

Introduction

Hypertension is the most important risk factor for cardiovascular diseases. The death and disability have risen by 31 per cent in recent years^[1]. The effect of elevated blood pressure increases the incidence of cardiovascular morbidity and mortality^[2]. Although antihypertensive therapy reduces the risks of cardiovascular and renal disease, large segments of the hypertensive population are either untreated or inadequately treated, which contributes as burden of cardiovascular diseases, including coronary heart disease (CHD), congestive heart failure (CHF), ischemic and hemorrhagic stroke, renal failure and peripheral arterial disease^[3]. The prevalence of microalbuminuria in hypertension in India according to the study conducted by R.K Sabharwal *et al.*, in 174 hypertensive subjects was found to be 33.3%^[4]. In another study by Hitha *et al.*, in the year 2008 in south India showed the prevalence of microalbuminuria in patients with essential hypertension to be 26.6%^[5].

Microalbuminuria has been shown to predict risk of cardiovascular events in patients with Primary hypertension^[6]. Many studies have proposed that albuminuria is a marker of target organ damage as it results in functional and structural changes in hypertension such as hypertensive vascular abnormalities, endothelial dysfunction, hypertensive related cardiac abnormalities and impairment of renal function^[7]. A review of several studies of Microalbuminuria in Essential Hypertension by Stefano Bianchi *et al.*, observed an increase frequency of cardiovascular events in hypertensive patients with microalbuminuria compared to those with normal urine albumin excretion^[8]. Hiroyuk Takase *et al.*, concluded that urinary Albumin is an independent predictor of hypertension and the increase in blood pressure in the general population even in the normal range below the threshold defined for microalbuminuria^[9].

Urinary albumin excretion reflects overall changes in vascular permeability and therefore may not indicate an explicit deterioration in renal function. The presence of increased urinary albumin excretion denotes an increase in the trans-capillary escape rate of albumin and therefore a marker of microvascular disease^[10].

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The association of microalbuminuria with hypertension may reflect early vascular abnormalities that contributes majority of cardiovascular morbidity and mortality. Clinical studies have shown that small increases in microalbuminuria indicate worsening cardiovascular (CV) disease, involving endothelial dysfunction and accelerated atherosclerosis, and are associated with significant increases in the risk of end-organ damage, major CV events and death^[11]. To improve the composite risk profile, it is essential to understand the underlying mechanisms of development of hypertension as well as to formulate the screening strategies that can reliably identify individuals most likely to develop CV risk.

Reduction of albuminuria translates to reduction of vascular abnormalities and endothelial dysfunction in hypertension, as albuminuria is an integrated marker of structural and functional abnormalities^[12]. The association of microalbuminuria with augmented cardiovascular risk may be explained at least partially by the frequent co-existence of elevated urine albumin excretion (UAE) with a series of well-established markers of cardiovascular risk such as dyslipidemia, non-diabetic hyperglycemia, higher body mass index, central obesity, high serum uric acid, increased salt sensitivity, dietary protein, smoking, sedentary life style, family history of essential hypertension, increased pulse pressure and absence of nocturnal BP decrease^[13, 14].

Ravera M. *et al.*, in their study observed that microalbuminuria is an early marker of preclinical brain damage in essential HTN and may therefore be useful for identifying patients as high risk for cerebral and cardiovascular events, for which preservative therapeutic measures are advisable^[15].

Hahnemann in aphorism 72 says that some diseases occur with imperceptible beginnings which dynamically derange the living being in its own peculiar manner and causes it to deviate gradually from the healthy condition. So is essential hypertension, in which it is almost always asymptomatic, many are unaware of its consequences over the years.

Few Clinical studies on the effectiveness of Homoeopathic medicines in hypertension have shown that both specific drugs and individualized approaches are effective in managing hypertension. There is a very limited literature available on the Homoeopathic management of albuminuria in hypertension. Hence this study is undertaken to understand the role of homoeopathic remedies in reducing urinary microalbumin. Consequently, reduction of microalbuminuria in essential hypertension using homoeopathic management may prevent vascular abnormalities in hypertension, thereby preventing CV risk.

Methodology

Research design: This is a quasi-experimental 6-month prospective study, with an evaluation before treatment and at the end of the treatment, without control design.

Sample size: The sample consisted of 32 cases of essential hypertension with microalbuminuria taken by purposive sampling method. The subjects were screened for blood pressure and urine albumin. The cases fulfilling the inclusion and exclusion criteria were selected for the study.

Source of data: This study was conducted on patients who reported the outpatient department of Father Muller Homoeopathic Medical College and Hospital, Deralakatte, Mangaluru. All patients age 18 years and above with

diagnosed case of Hypertension were selected for the study.

Period of study: The study was conducted on cases available from January 2019 - January 2020.

Inclusion criteria

- The sample of both sexes aged 18 years and above
- Diagnosed cases of Hypertension of stage I and stage II according to diagnostic criteria issued by JNC 7 World Health Organization
- Patients with urine albumin 30mg/dl and above

Exclusion criteria

- Patients diagnosed with diabetes mellitus or any other systemic diseases where the urine albumin is likely to be raised.
- Pregnant and lactating women

Materials and Method:

A study group of 32 cases of essential hypertension having urine albumin of 30-300mg/dl based on purposive sampling as per inclusion criteria. Data was collected from subjects by interviewing and clinical examination, after obtaining a written consent. Blood pressure was measured using a standard mercury sphygmomanometer, subjects who fall under stage I HTN i.e., SBP 140- 159 mmHg, DBP of 90-99 and stage II HTN i.e., SBP \geq 160 mmHg, DBP of \geq 100 were assessed by urine albumin excretion value before treatment, after 3 months and at the end of study period with homoeopathic treatment.

- Urine albumin concentration was measured by a turbidometric immunoassay.
- The data was recorded in the Standardized Case Record (SCR) of Father Muller Homoeopathic Medical college and Hospital, analyzed, totality was erected and suitable remedy with suitable potency and dose was administered. Therapeutic plan was evolved individually for each case.
- After following up the cases the inferences were drawn by analysis of the outcome. There were no control groups used in the study and all subjects were treated on outpatient basis.

Follow ups

Patients were followed for a period of 6months from the commencement of treatment.

- BP was monitored in every follow up
- Urine Albumin estimation was evaluated at the end of every 3 months.

Assessment of effectiveness

Effectiveness of the treatment was assessed on the following basis:

- Patients were evaluated at every follow up for the changes in BP to understand the improvement.
- Urine albumin excretion values were evaluated for all the patient at the end of three months and at the end of 6 months and changes were analyzed.

The remedies prescribed were all manufactured at Father Muller Homoeopathic Pharmaceutical Division and dispensed at Out Patient Department of Father Muller Homoeopathic Medical College and Hospital, Mangaluru.

Statistical analysis

Assessment of the clinical status were analyzed by using ANOVA of repeated measures, with the help of IBM SPSS 23 software version.

Research hypothesis [H₁]

Significant reduction in urine albumin and changes in Blood Pressure is observed after homoeopathic treatment.

Null hypothesis [H₀]

No significant reduction in urine albumin and no changes in Blood Pressure is observed after homoeopathic treatment.

Results and observation

In this study 32 subjects were included as per inclusion criteria. All these cases were followed up for a minimum of six months and considered for statistical study.

1. Distribution of case according to gender

Table 1: Case distribution according to gender

Gender	Frequency	Percentage
Female	18	56.3%
Male	14	43.8%
Total	32	100.0 %

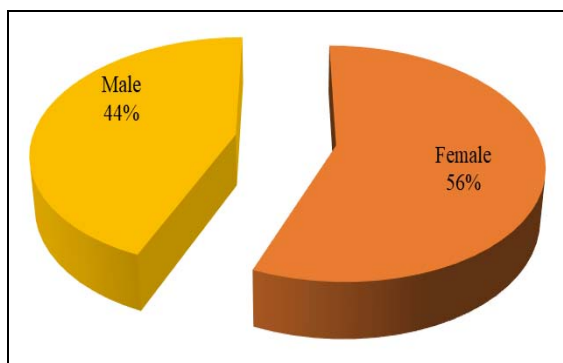


Fig 1: Case distribution according to gender

Of the 32 cases 18 cases were females (56.3%) and 14 cases

were males (43.8%).

2. Distribution of Case According To Age

Table 2: Case distribution according to age

Age	Frequency	Percentage
40 – 50	4	12.5%
51 – 60	15	46.9%
61 – 70	6	18.8%
Above 70	7	21.9%
Total	32	100.0%

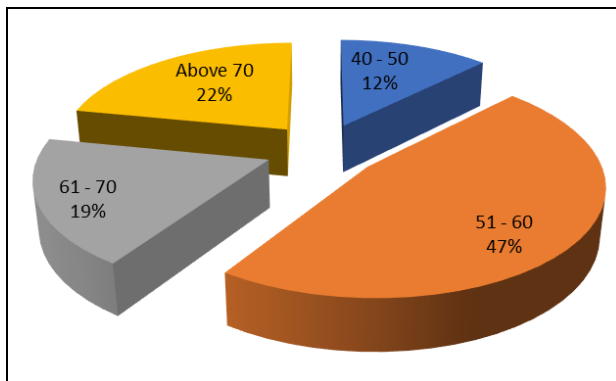


Fig 2: Case distribution according to age

Of the 32 subjects included in the study, 15 cases age distribution between 51-60 (47%), 7 cases aged above 70 (22%), 6 cases age between 61-70 (19%) and 4 cases age between 40-50 (12%).

3. Distribution According To Duration Of Essential Hypertension

Table 3: Case distribution according to duration of hypertension

Htn Since	Frequency	Percentage
5 yrs and below	21	65.6%
6 - 10yrs	7	21.9%
Above 10 yrs	4	12.5%
Total	32	100.0%

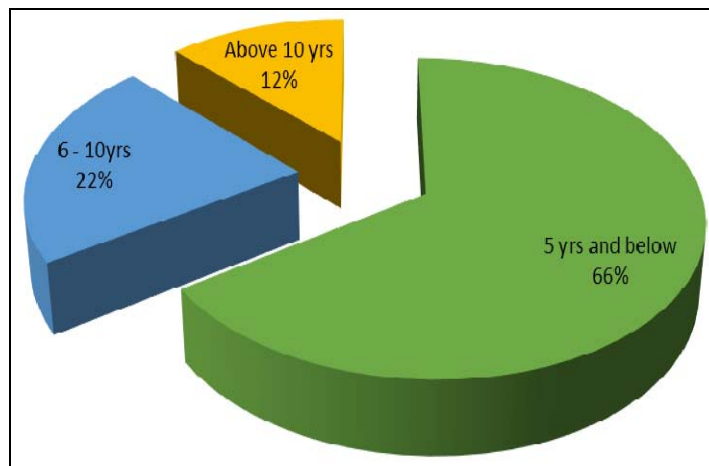


Fig 3: Case distribution according to duration of hypertension.

The highest prevalence of urine microalbumin in hypertensive subjects according to duration of HTN in the 32 subjects was found 66% in 21 cases below 5 years

duration, 22% in 7 cases of duration below 6years and least 12 % in 4 cases of duration above 10 years.

4. Distribution of Case According To Remedies

Table 4: Case distribution according to Remedies

Remedy	No of cases	Percentage
Crategus O	5	15.6%
Bar Mur	5	15.6%
Rauwolfia S	4	12.5%
Calc Ars	4	12.5%
Calc carb	3	9.3%
Causticum	3	9.3%
Nat Mur	2	6.25%
Rhus tox	2	6.25%
Glonoine	1	3.1%
Conium mac	1	3.1%
Medorrhinum	1	3.1%
Lachesis M	1	3.1%

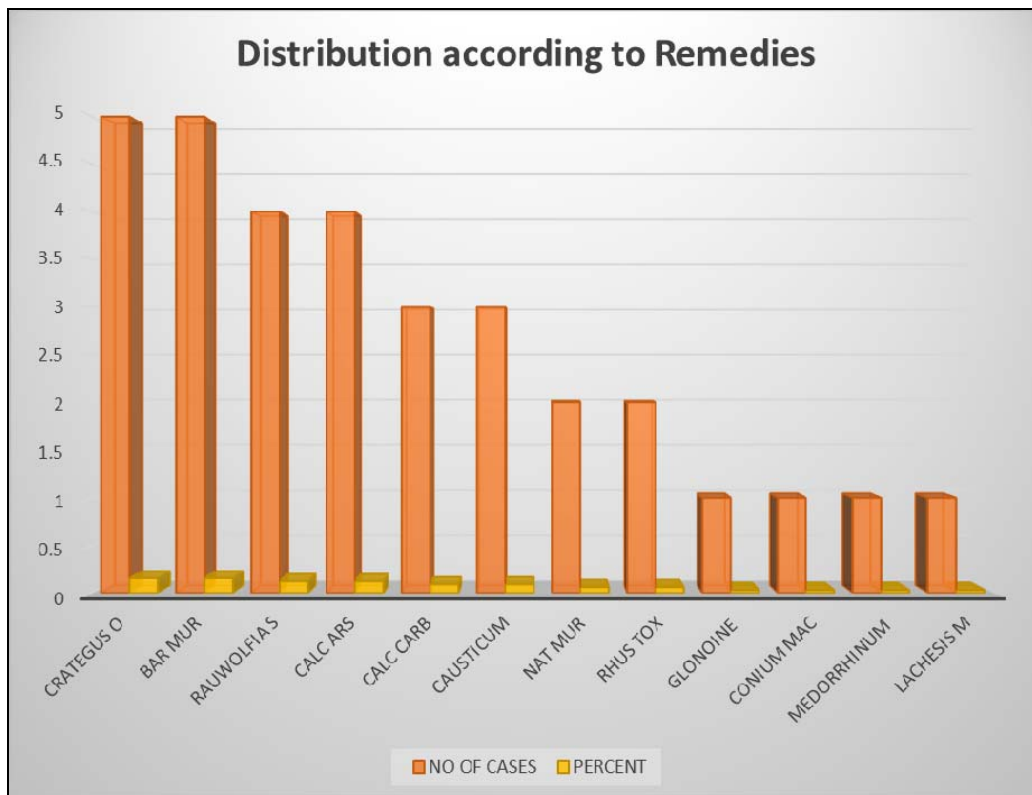


Fig 4: Case distribution according to Remedies

The most frequently prescribed remedies were Crataegus and Baryta Mur for 5cases (15.6%) each, Rauwolfia S and Calcarea Ars for 4 cases (12.5%) each, Calcarea Carb and Causticum for 3 cases (9.3%) each, Natrum Mur and Rhus

tox for 2 cases (6.25%) each, Glonione, Conium, Medorrhinum, and Lachesis each 1 case (3.1%).

5. Analysis of Diastolic Blood Pressure

Table 5: Analysis of DBP using ANOVA for repeated measures

DBP	N	Mean	Std. Deviation	Repeated Measures ANOVA F value	P
Day 0	32	92.19	4.20	38.616	.000
3months	32	87.94	6.33		HS
6months	32	85.00	5.68		

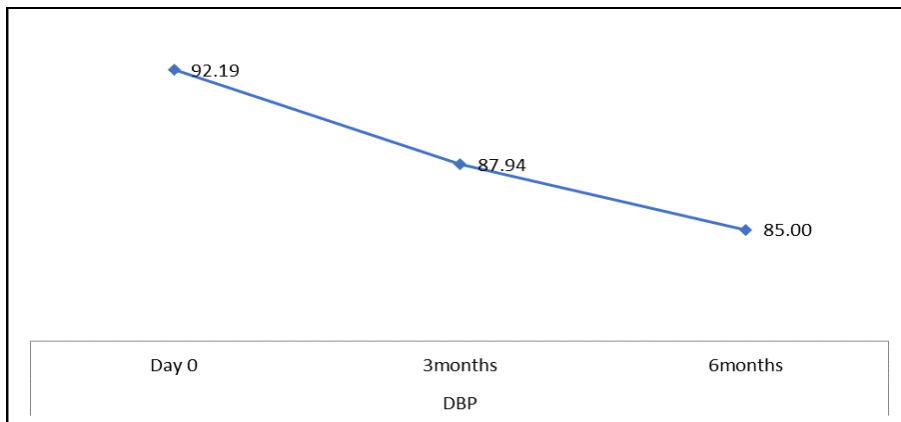


Fig 5: Mean DBP at Day 0, 3months and 6months

The mean value DBP on day 0 (before treatment) is 92.19mmHg with standard deviation of 4.20.

After 3months (3 months after treatment) the mean value DBP is 87.94mmHg with standard deviation of 6.33.

After 6month (6months after treatment) the mean value of DBP is 85.00mmHg with standard deviation of 5.68.

Statistical analysis of DBP at Day 0, 3months, 6 months were done using ANOVA of repeated measures. Result showed ‘F’ value as 38.616 and the ‘p’ value as .000 indicating highly significant improvement of DBP 6months after homoeopathic treatment. So further pairwise comparison was done.

Table 6: Pairwise Comparison of DBP

	Parameter: DBP			Bonferroni p value	
	Mean difference	Std. Deviation of difference	Change (%)		
Day 0 - 3months	4.250	4.892	4.61	.000	HS
Day 0 - 6months	7.188	4.568	7.80	.000	HS
3months - 6months	2.938	4.486	3.34	.002	HS

The mean difference from Day 0 to 3months is 4.250 with standard deviation of difference 4.892 and percentage of changes is 4.61 %, ‘p’ value is.000 denotes that there is highly significant improvement of DBP after 3months with homoeopathic treatment.

From Day 0 to 6months the mean difference is 7.188 with standard deviation of difference 4.568 and percentage of changes is 7.80%, ‘p’ value is.000 denotes that there is highly significant improvement of DBP after 6months with

homoeopathic treatment.

From 3months to 6months the mean difference is 2.938 with standard difference of 4.486 and percentage of changes is %, ‘p’ value is.002 denotes that there is highly significant improvement of DBP from 3months to 6months with homoeopathic treatment.

6. Analysis of Systolic Blood Pressure

Table 7: Analysis of SBP using ANOVA for repeated measures

	N	Mean	Std. Deviation	Repeated Measures ANOVA F value	P
Day 0	32	150.50	8.21	28.855	.000
3months	3.3432	144.19	7.88		
6months	32	139.06	8.75		

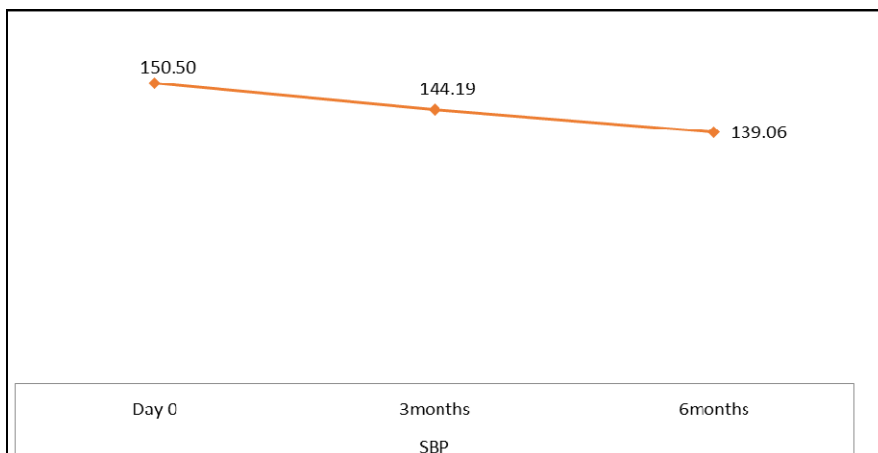


Fig 6: Mean SBP at Day 0, 3months and 6months

The mean value SBP on day 0 (before treatment) is 150.50mmHg with standard deviation of 8.21.

After 3months (3 months after treatment) the mean value SBP is 144.19mmHg with standard deviation of 7.88.

After 6month (6months after treatment) the mean value of SBP is 139.06mmHg with standard deviation of 8.75.

Statistical analysis of SBP at Day 0, 3months, 6 months were done using ANOVA of repeated measures. Result showed 'F' value as 28.855 and the 'p' value as .000 indicating highly significant improvement of SBP 6months after homoeopathic treatment. So further pairwise comparison was done.

Table 8: Pairwise comparison of SBP

	Parameter: SBP			Bonferroni p value	
	Mean difference	Std. Deviation of difference	Change (%)		
Day 0 - 3months	6.313	6.949	4.19	.000	HS
Day 0 - 6months	11.438	8.861	7.60	.000	HS
3months - 6months	5.125	9.571	3.55	.015	sig

The mean difference from Day 0 to 3months is 6.313 with standard deviation of difference 6.949 and percentage of changes is 4.19 %, 'p' value is .000 denotes that there is highly significant improvement of SBP after 3months with homoeopathic treatment.

From Day 0 to 6months the mean difference is 11.438 with standard deviation of difference 8.861 and percentage of changes is 7.60%, 'p' value is .000 denotes that there is highly significant improvement of SBP after 6months with

homoeopathic treatment.

From 3months to 6months the mean difference is 5.125 with standard deviation of difference 9.571 and percentage of changes is 3.55%, 'p' value is .015 denotes that there is significant improvement of SBP from 3months to 6months with homoeopathic treatment.

7. Analysis of Urine Microalbumin

Table 9: Analysis of Urine Microalbumin using ANOVA for repeated measures

	N	Mean	Std. Deviation	Repeated Measures ANOVA F value	P
Day 0	32	168.00	65.15	30.722	.000
3months	32	159.97	63.79		HS
6months	32	154.41	63.45		

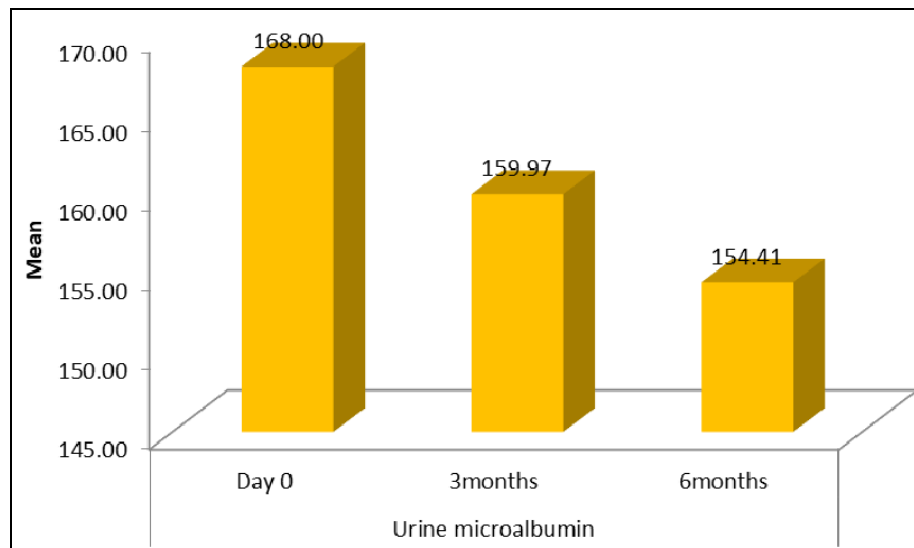


Fig 7: Mean Urine Microalbumin at Day 0, 3months and 6months

The mean value of Urine microalbumin on day 0 (before treatment) is 168.00mg/dl with standard deviation of 65.15. After 3months (3month after treatment) the mean value is 159.97mg/dl with standard deviation of 63.79.

After 6months (6month after treatment) the mean value of urine microalbumin is 154.41mg/dl with standard deviation of 63.45.

Statistical analysis of urine microalbumin at Day 0, 3months, 6 months were done using ANOVA of repeated measures. Result showed 'F' value as 30.722 and the 'p' value as .000 indicating highly significant improvement of urine microalbumin 6months after homoeopathic treatment. So further pairwise comparison was done.

Table 10: Pairwise Comparison of Urine Microalbumin

	Parameter. Urine microalbumin			Bonferroni p value	
	Mean difference	Std. Deviation of difference	Change (%)		
Day 0 - 3months	8.031	7.731	4.78	.000	HS
Day 0 - 6months	13.594	10.482	8.09	.000	HS
3months - 6months	5.563	11.057	3.48	.023	sig

The mean difference from Day 0 to 3months is 8.031 with standard deviation of difference 7.731 and percentage of changes is 4.78%, 'p' value is .000 denotes that there is highly significant improvement of urine microalbumin after 3months with homoeopathic treatment.

From Day 0 to 6months the mean difference is 13.594 with standard deviation of difference 10.482 and percentage of changes is 8.09%, 'p' value is .000 denotes that there is highly significant improvement of urine microalbumin after 6months with homoeopathic treatment.

From 3months to 6months the mean difference is 5.563 with standard difference of 11.057 and percentage of changes is 3.48%, 'p' value is .023 denotes that there is significant improvement of urine microalbumin from 3months to 6months with homoeopathic treatment.

Statistical analysis

Collected data was summarized by mean, standard deviation frequency and percentage. To find the significant changes after the treatment ANOVA of repeated measures was used followed by Post hoc analysis by Bonferroni test, in all DBP, SBP and Urine microalbumin parameters which showed P value was .05 was considered significant. Analysis of the data was carried out using SPSS software version 23.

Inference

There is significant reduction in the urine micro albumin ($p=.000$) and significant changes in SBP ($p=.000$) and DBP ($P=.000$) after homoeopathic treatment. Hence null hypothesis is rejected and alternative hypothesis is accepted.

Discussion

The study was undertaken to know the role of homoeopathic management in reduction of microalbuminuria of essential hypertension. This study of 32 patients the prevalence of microalbuminuria was found to be higher among females i.e., 18 cases were females (56.3%) and 14 cases were males (43.8%). This correlates with the previous study by Hitha *et al.*,^[5] that the prevalence of microalbuminuria in essential hypertension is higher in females and partially corresponds with a study by Poudel *et al.*^[16]

In this study the prevalence of microalbuminuria is high among the age group of 51-60(46.9%), followed by aged above 70 (22%), age between 61-70 (19%) and least in age between 40-50 (12%), this statistic correlates with other studies by Hitha *et al.*,^[5] and Hans Ibsen *et al.*,^[12] that the relative risk of development of microalbuminuria increased steadily with advancing age.

The prevalence of microalbuminuria among hypertensives and its relation to the duration of HTN was observed to be higher in those with the longer the duration of HTN^[5, 17]. Contrary to the above observation, the present study found that the highest prevalence of urine microalbumin in hypertensive subjects according to duration of HTN was 66% in subjects of below 5years duration, 22% subjects of duration below 6years and least 12 % in subjects of duration above 10 years. The small sample size might be the reason

for this discrepancy.

Most prescribed medicines were Crataegus and Baryta Mur for 5cases (15.6%) each, Rauwolfia and Calcarea Ars for 4 cases (12.5%) each, Calcarea Carb and Causticum for 3 cases (9.3%) each, Natrum Mur and Rhus tox for 2 cases (6.25%) each, Glonione, Conium, Medorrhinum, and Lachesis each 1 case (3.1%). The medicines were prescribed on the totality of characteristics signs and symptoms of the patients. In a study by Saha *et al.*, the most often prescribed homoeopathic medicines were Natrum Mur, Calcarea Carb, Sulphur, Thuja Occ., Nitric acid, Causticum, Medorrhinum, Staphysagria, Digitalis and Glonoine which correlates with this present study^[13, 18].

In this study the mean value DBP on day 0, at 3months and at 6months were 92.19mmHg, 87.94mmHg and 85.00mmHg respectively. Statistical analysis using ANOVA of repeated measures showed 'F' value as 38.616 and the 'p' value as .000 indicating highly significant improvement of DBP 6months after homoeopathic treatment.

In this study it was found that the mean SBP on day 0, after 3months and after 6months were 150.50mmHg, 144.19mmHg and 139.06mmHg respectively. ANOVA of repeated measures shows 'F' value as 28.855 and 'p' value as .000 which denotes a highly significant improvement in SBP values after homoeopathic treatment. The above finding correlates with a study done by Subhranil Saha *et al.*, which states that individualized homoeopathy produced some hypotensive effect when prescribed based on homoeopathic principles^[18].

In this study it was found that the mean urine albumin at day 0 was 168.00mg/dl, after 3months 159.97mg/dl and after 6 months 154.41mg/dl respectively. ANOVA of repeated measures shows 'F' value as 30.722 and 'p' value as .000 which denotes highly significant improvement in urine albumin values after homoeopathic treatment.

After analyzing the results of this study, it was found that homoeopathic medicines not only reduce the SBP and DBP but also a significant reduction of urine albumin concentration was observed through statistical analysis of the results obtained which indicates that homoeopathic treatment may prevent progression of the disease and thereby translate to regression of a number of vascular abnormalities or cardiovascular risk in essential HTN.

Conclusion

After an analysis of before, during & after 6 months of treatment, statistical analysis showed the 'p' value 0.000, which is highly significant. The above statistical evidence indicates that homoeopathic medicine is effective in reducing urine albumin concentration, SBP and DBP. Thus, the study shows that homoeopathic medicines are effective in management of essential hypertension and thereby reducing the urine microalbuminuria.

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