EFFECT OF ORAL SODIUM BICARBONATE IN MAINTAINING ACID BASE BALANCE AND QOL IN CHRONIC KIDNEY DISEASE AND LONG-TERM ACIDOSIS

ABSTRACT :

AIM: Aim of the study is to determine the effect of oral sodium bicarbonate in maintaining acid base balance and quality of life in chronic kidney disease and long-term acidosis patients.

Study design: A prospective observational study.

Study population*:* Approximately 174 people who came to nephrology department.

Study Duration : 6 months (December 2021- May 2022)

METHODOLOGY: : A prospective observational study on **EFFECT OF ORAL SODIUM BICARBONATE IN MAINTAINING ACID BASE BALANCE AND QUALITY OF LIFE IN CHRONIC KIDNEY DISEASE AND LONG TERM ACIDOSIS PATIENT'S** which was carried out in the Department of.

RESULTS: Most of the patients are in between the age of 70-80 years, married,with good nutritional status, with minimum 5 months of CKD ,approximately 50%of the patients are suffering from HTN along with CKD followed by diabetes. Patients are using OSB for a minimum of 5 months with 500mg dose given thrice a day, along with Calcium channel blockers and pantoprazole. OSB is given as a oral tablet.

CONCLUSION: Oral bicarbonate is widely used to correct acidosis in advanced CKD, this is not underpinned by trial evidence, and real uncertainty exists regarding the balance of benefit and risk for this intervention. That we concluded that most of the patients using OSB was analyzed from nephrology department in QOL, in maintaining acid-base balance was observed in CKD patients.

KEYWORDS: Chronic kidney disease, Metabolic disease, Oral sodium bicarbonate, Quality of life. .

1.INTRODUCTION: Chronic kidney disease (CKD) is the progressive, irreversible decreasing of renal function. Which is resulting from long standing disease, CKD sometimes derives from ARF that does not respond to treatment. [1,15] In a clinical study in patients suffering with CKD (circle 15-30ml/min/1.73(2)), sodium bicarbonate 600mg orally 3 times a day were administered to preserve renal function. Serum bicarbonate was adjusted as needed to maintain serum bicarbonate levels of at least 23mmol per liter Decreased pH due to HCO3 – reduction is known as metabolic acidosis.[3,24]

Bicarbonate deficit – blood concentration of bicarbonate decreases from 22mEq/L. Oral sodium bicarbonate is used in treating metabolic acidosis in patients suffering with CKD.[5]

2.MATERIALS AND METHODS/EXPERIMENTAL DETAILS/METHODOLOGY:

Sodium Bicarbonate In Maintaining Acid Base Balance And Quality Of Life In Chronic Kidney Disease And Long Term Acidosis Patient's which was carried out in the Department of nephrology.

Study design: A prospective observational study.

Place of study: A prospective observational study on Effect Of Oral Sodium Bicarbonate In Maintaining Acid Base Balance And Quality Of Life In Chronic Kidney Disease And Long Term Acidosis Patient's which was carried out in the Department of nephrology.

Study population: Approximately 174 people who came to nephrology department.

Study criteria / patient enrollment: Patients are enrolled in study based on inclusion and exclusion criteria.

Inclusion criteria: the patients who are diagnosed with CKD and receiving oral sodium bicarbonate as part of treatment

Exclusion criteria: the patients who are having other comorbidities, hypertension, diabetes, and other cardiovascular problems who are not given with oral sodium bicarbonate.

Study Materials:

A.Patient informed consent form

B.A specially designed patient data collection proforma.

Study Method: This study will be initiated after obtaining the permission from the institutional review board. the patients will be enrolled in study after taking informed consent from them, the enrolment of patient will be done on basis of inclusion and exclusion criteria.

The data for the present will be collected by graph pad prism, which is well-suited to identify all necessary baseline information, which includes

Patient demographics like

Study procedure:

Age

Socio economic status

Educational status

High risk factors

Past and present history

Laboratory data

Radiographic data

Physiscian medication order form

NURSE'S medication administration record (drug chart) and any other verbal communication data

1.Analytical epidemiologic studies are most useful for testing a hypothesized association between human exposure and health effects. Analytic study design includes prospective studies.

A prospective observational study was conducted for six months of duration in the NEPHROLOGY DEPARTMENT.

Based on inclusion and exclusion criteria the CKD patients receiving oral sodium bicarbonate were recruited in the study.

The data was collected from graph pad prism and personal (patient representative /and patient). Interviews, by using a well – structured.

Patient data collection proforma and followed up.

All the necessary and relevant baseline information was collected on patient data collection proforma which includes:

Patient demographic details such as age, gender, personal history, habits, and employment status.

Past medication history.

Past medical history.

Present medication.

Risk factors (modifiable and non-modifiable).

The collected and documented data was analyzed based on following parameters.

1.PATIENT DISTRIBUTION BASED ON DEMOGRAPHIC DATA:

Patient distribution based on age

Patient distribution based on gender

Patient distribution based on personal history and social habits.

2.Patient distribution based on risk factors

3.Patient distribution based on drug regimen.

4.Patient distribution based on stage of CKD.

Statistical analysis:

The Percentage method was used to analyses the patient distribution based on various parameters.

T-test will be performed to calculate p-value for the purpose of comparison of results.

RESULTS AND DISCUSSION: Most of the patients are in between the age of 70-80 years, married,with good nutritional status, with minimum 5 months of CKD ,approximately 50%of the patients are suffering from HTN along with CKD followed by diabetes. Patients are using OSB for a minimum of 5 months with 500mg dose given thrice a day, along with Calcium channel blockers and pantoprazole. OSB is given as a oral tablet. In our study we have gathered the data of the patients who are using oral sodium bicarbonate are considered based on inclusion and exclusion criteria. The main reason for admission in the nephrology ward and reasons for using oral sodium bicarbonate are evaluated and estimated in the CKD patients .The comorbid conditions of the patients and duration of treatment its effects are also analyzed .Mostly the information regarding oral sodium bicarbonate is analyzed and documented. The quality of life of the patient before and after oral sodium bicarbonate usage and treatment outcomes changes in lifestyle was also discussed. The following tables are used to obtain results.

Table:1 Showing age, marital status, nutritional status and education of patients.

Age	**No. of patients**	**Percentage(%)**
10-20	2	1.14
20-30	6	3.44
30-40	19	10.91
50-60	36	20.68
60-70	38	21.83
70-80	51	29.31

80-90	22	12.643
90-100	00	00
Marital status		
Married	166	95.4
Unmarried	8	4.5
Education		
Primary education	2	1.1
Secondary education	120	68.9
Higher education	4	2.2
Uneducated	48	27.5
Nutritional status		
Excellent	13	7.47
Good	97	55.7
Poor	64	36.7

Table:2 Showing duration of chronic kidney disease

Duration of CKD	No. of patients	Percentage(%)
12	32	18.39
5	74	42.52
1	13	7.47
3	34	19.54
6	3	1.72
8	18	10.34

Table:3 Showing reasons for patient admission

Reason for admission	No. of patients	Percentage(%)
CKD with HTN	86	49.42
DCMP WITH LV Dysfunction	22	12.6
DM with CKD	38	21.38
Urosepsis	12	6.8
Anemia	8	4.59
UTI	8	4.59

Table:4 Showing treatment outcomes

Treatment outcomes	No. of patients	Percentage(%)

Recovered	124	71.26
Not recovered	47	27.0
No change	00	00
Shifted to higher centres	00	00
Left against to medical advice	00	00
Economic burden	3	1.724

Table:5 Showing Duration of oral sodium bicarbonate

Sodium bicarbonate duration (months)	**No . of patients**	**Percentage (%)**
1	13	7.47
3	34	19.54
5	106	60.91
6	3	1.72
8	18	10.34

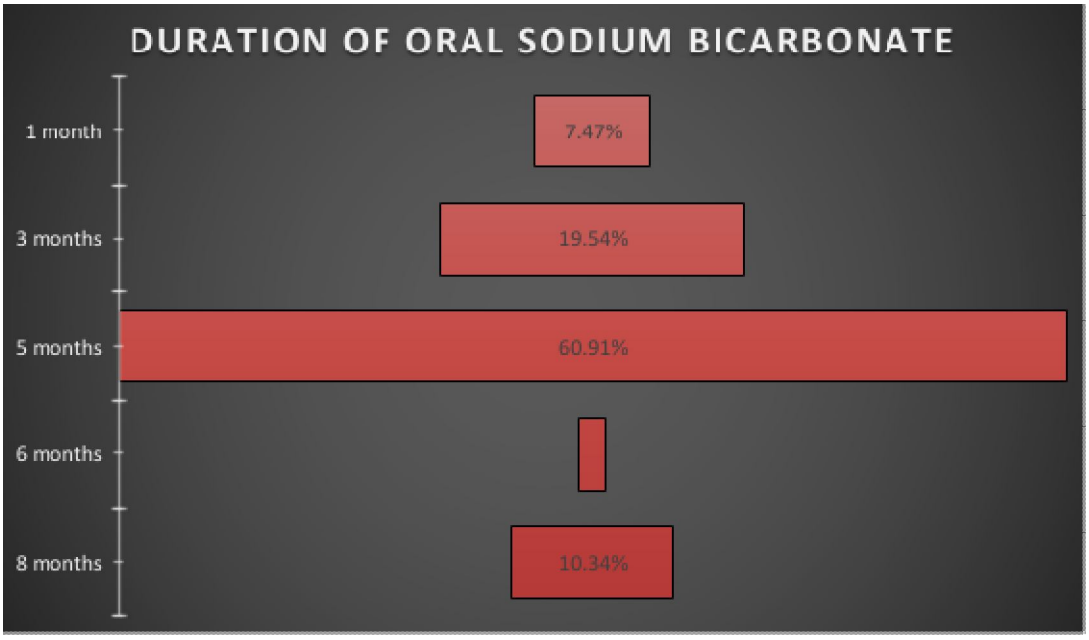

Figure 1 : Duration of oral sodium bicarbonate

Table:6 Showing routes of oral sodium bicarbonate

Sodium bicarbonate route	**No. of patients**	**Percentage (%)**

Oral	174	100
Other routes	0	0

Table:7 Showing treatment for metabolic acidosis

Treatment for acid base balance	No. of patients	Percentage (%)
Sodax	116	66.66
Sobonix	1	0.57
Sobosis	57	32.75

Table:8 Showing doses of oral sodium bicarbonate

Dose of oral sodium bicarbonate	No. of patients	Percentage(%)
1 gm ,OD	35	20.11%
500mg , TID	139	79.88%

Table 9:Showing different class of drugs used in CKD

Class of drug	No. of patients	Percentage(%)
Calcium channel blockers	97	55.74%
Aminoglycosides antibiotics	53	30.45%
Cephalosporin antibiotics	72	41.37%
Nutritional supplements	159	91.37%
Antacids	162	93.1%
Ca supplements	45	25.8%
Alkalising agent	174	100%

Table:10 Showing mostly used drugs with oral sodium bicarbonate.

Drug	No. of patients	Percentage(%)
Tab.Nicardia	97	55.74%
Tab.Lasix	72	41.37%
Tab.Azithromycin	53	30.45%
Tab.Cefglobe	72	41.37%
Tab.Pantoprazole	162	93.1%
Tab.Shelcal	45	25.8%
Tab.Meropenem	46	26.43%

Table:11 Showing quality of life of patients

Quality of life	No. of patients	Percentage(%)
Excellent	44	25.28
Good	69	39.65
Poor	61	35.05

CONCLUSION:

Oral bicarbonate is widely used to correct acidosis in advanced CKD, this is not underpinned by trial evidence, and real uncertainty exists regarding the balance of benefit and risk for this intervention. As most patients with CKD are old, and many are frail, it is critical that trials testing such interventions enroll typical patients and use outcome measures that are relevant to older people. Few older people with even advanced CKD will progress to end-stage renal disease; the risk of death from cardiovascular disease or infection often supervenes long before the need for renal replacement therapy. The range of outcomes selected for this study will allow an estimation of overall net benefit or harm across a range of disease outcomes including renal, and also maintaining acid base balance, as well as focusing on outcomes that are important to patients. So that we concluded that most of the patients using OSB was analyzed from nephrology department in QOL, in maintaining acid-base balance was observed in CKD patients .OSB supplements produce a dose dependent increase in serum bicarbonate was observed. Clinicians and clinical pharmacists have updated knowledge for treating the condition by using OSB. Future studies should determine improvement in functional outcomes in patients with CKD.

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ABBREVATIONS:

SL.NO	ACRONYMS & ABBREVATIONS	TERMINOLOGY
1	OSB	Oral Sodium Bicarbonate
2	QOL	Quality of life
3	CKD	Chronic Kidney Disease
4	GFR	Glomerular Filtration Rate
5	ARF	Acute Renal Failure
6	CHF	Congestive Heart Failure
7	GIF	Gastro Intestinal Tract
8	BUN	Blood Urea Nitrogen
9	ACE	Angiotensin Converting Enzyme
10	PT	Prothrombin Time
11	FDA	Food and Drug Administration
12	ESRD	End Stage Renal Disease
13	WHO	World Health organization

14	VA	Alveolar Ventilation
15	COPD	Chronic Obstructive Pulmonary Disease
16	ABG	Arterial Blood Gas
17	CO	Carbon monoxide
18	OHS	Obesity Hypoventilation Syndrome