A STUDY OF SERUM ELECTROLYTES

IN

INFANTILE & EARLY CHILDHOOD DIARRHOEA

A THESIS

FOR

DOCTOR OF MEDICINE (PAEDIATRICS)

OF

UNIVERSITY OF RAJASTHAN

1966 (OCTOBER)

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C E R T I F I C A T E

Certified that Dr. Swayambar Prasad Sudrania has carried out the various biochemical investigations connected with the study of "SERUM ELECTROLYTE CHANGES IN DIARRHOEA AMONG INFANTS AND CHILDREN UPTO THE AGE OF 5 YEARS" in this Department under my guidance and supervision. All the investigations connected with this study were carried out by the candidate himself.

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C O N T E N T S.

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C E R T I F I C A T E.

This is to certify that this work of Thesis on "SERUM ELECTROLYTES CHANGES IN DIARRHOEA AMONG INFANTS AND CHILDREN UPTO THE AGE OF 5 YEARS" is based on a study of 100 cases by Dr. Swayambar Prasad Sudrania, has been carried out under my supervision and guidance in the Paediatric Wards of S.M.S. Hospital and Physiology & Biochemistry Laboratory of S.M.S. Medical College, Jaipur.

I am glad to certify that all the investigations in connection with this study were carried out by the candidate himself.

This Thesis is recommended for the degree of M.D.(Paediatrics) Part II Examination.

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INTRODUCTION.

Since time immemorial diarrhoea has been quite a common disease in infancy and childhood, all over the world, specially in underdeveloped countries.

In India diarrhoea is quite common. According to study done by Achar and Athreya at Madras(1964) one patient out of every ten patients, whoever attends the outdoor, is a diarrhoea case as taken in average of one full year.

In S.M.S. Hospital, Jaipur(1965) the incidence is 15% in out patient department and 20% in indoor patient department, as taken average of one full year.

In summer and rainy seasons the diarrhoea cases increase enormously. The diarrhoea if left untreated leads to fatal results, hence earlier treatment prevents the disaster.

If the diarrhoea is associated, with such conditions in which water and electrolytes are lost further, the condition becomes quite complicated, where earliest management is required.

Though the subject is quite common still then it has not been studied so well in India than in foreign countries.

In view, a planned study of serum electrolytes in diarrhoea among infants and children upto 5 years of age has been tried.

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CONTENTS OF REVIEW OF LITERATURE.

CONCLUSIONS.

During the present study 10 control cases and 100 diarrhoea cases were taken. The normal control cases presented normal range of serum levels of studied electrolytes.

In the present series of study, moderate type of diarrhoea was maximum and severe was minimum. Males were more prone to diarrhoea than females. The most susceptible age for diarrhoea is less than one year. Poor patients due to unhygienic conditions are more susceptible than well to do persons. Mixed feeding predisposes to diarrhoea because of greater chances of infections in artificial feeding.

Most of the cases were infective diarrhoea and very few were of helminthic in origion. Moderate anaemia was more than mild and severe anaemia. Similarly moderate fever was more than high fever.

In this present study, so many presenting clinical features were associated with diarrhoea. Among which maximum incidence was of abdominal distension, fever, vomiting, unconciousness and cough.

Hyponatraemia was quite common which was due

to high environmental temperature, fever, sweating, vomiting and hypotonic dietary feeding to the children.

Hypokalaemic cases were more due to the same factors. Hyperkalaemia cases may be due to acidosis causing potassium shift from cells to serum.

Hypochloraemia was also quite common due to the same reasons. In 3 % hyperchloraemia was present.

Low Co_2 Combining Power (Low alkali reserve a acidosis or low serum Bicarbonate level) was so common i.e. in 90 % cases so that acidosis was handled specifically in association to dehydration and causative factors.

In all cases parallelism in serum electrolytes could not be maintained but in some cases it was observed as the body is not an inert chemical container.

Clinically and biochemically, most of the cases responded well. Some cases could not achieve their normal weight because of not following the instruction for giving required amount of oral fluid therapy by the mothers. In some, acidosis was not corrected, because of less transfusion of lactate solutions.

Out of 25 cases, in half of the cases B.Coli was found in Rectal swab culture and in rest half all other organisms were cultured.

Fluid output and input remained low but the

dehydration was corrected well. The reason for low readings was human limitations for error.

Recovery percentage on discharge was quite satisfactory. Responded well to the treatment in shortest possible period i.e. average 10 days.

In last it can be concluded that during management of diarrhoea and dehydration, environmental temperature, sweating, fever, vomiting, malnutrition and acidosis should be kept in mind. Some extra amount of fluid and electrolytes than expected should be administered during the treatment so that quick and safe recovery can be expected.

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SUMMARY.

1. In present study 10 controls and 100 diarrhoea cases were taken. Controls showed normal range of serum electrolyte level as reported by other workers.

2. In review of literature, efforts have been done to present maximum possible informations on the subject.

3. The materials and methods used for investigation have been discussed in detail.

4. The serum study was done before administration of therapy, during treatment and at the time of discharge, as far as possible.

5. Incidence of diarrhoea in relation to severity, age, sex, financial status, type of feeding and presenting symptoms were analysed.

6. Presence of fever, anaemia, causative factors of diarrhoea and stool culture were also co-related.

7. Stress has been given to keep the following factors in mind while managing the cases of diarrhoea e.g. Environmental temperature, insensible losses, fever and vomiting etc.

8. Hyponatraemia, hypokalaemia, hypochloraemia and low

Co_2 Combining Power and acidosis was present in most of the cases.

9. In some cases no parallelism in serum electrolyte changes was observed.

10. Rectal swab culture showed B.Coli in 56 % cases and in rest cases, other organisms were found.

11. Input and output charts indicate that fluid given and excreted was low (though dehydration was corrected) which is due to human error i.e. some fluid given and excreted was not entered in the charts.

12. The requirement, administration, estimated & actual correction of serum electrolytes does not follow the mathematical rules.

13. The clinical recovery was earlier than biochemical recovery.

14. On following the fundamental principles of treatment of the diarrhoea cases, the recovery remained quite satisfactory.

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