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Relationship of Some Electrolytes and Blood Groups and Rh factor and Type of Breastfeeding with Febrile convulsions in Children in Baghdad/Iraq

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ABSTRACT

The current study was conducted to study physiological and biochemical variables and their role in the occurrence of Febrile convulsions in children in the city of Baghdad by measuring the percentage of Some Electrolytes, Blood Groups, Rh Factor and Type of Breastfeeding. The number of samples in the current study was 90, which were divided into two groups: the control group included 30 samples and the injured group included 60 samples. The ages of the children ranged from 6 months to 60 months, and collecting samples from the Central Child Teaching Hospital in Baghdad (Al-Karkh) for the period between 2 August until 15 November 2022, The study concluded that there was a significant decrease in the concentration of sodium in the blood serum and no significant difference in the concentrations of chlorine and potassium in the blood serum. The percentages of blood groups revealed that the B group is more susceptible to infection and the A group is less likely to be infected, while the percentages of the O and AB groups were the same, and the Rh factor did not show any difference in percentage.

INTRODUCTION

Febrile convulsion is a most common form of childhood convulsion that occurs in 2-5% of them which represented the most common childhood convulsion disorder, exit only in association with an elevated temperature. Evidence suggests, however, that they have little connection cognitive function, so that prognosis for normal neurologic function is excellent with children with febrile convulsion (Swaiman , 2006). In the United States and Western Europe, they occur 2–4% of all children; In Japan, however, 9–10% of all children experience febrile convulsion, and rates as high as 14% have been reported from the Mariana Islands in Guam (Shinnar , 2002). Febrile convulsions occur in young children at a time in their development when the convulsion threshold is low. This is a time when young children are susceptible to frequent childhood infections such as upper respiratory infection, , viral syndrome, and they respond with comparably higher temperatures (Landreau-Mascaro , 2002). Animal studies suggest a possible role of endogenous pyrogens, such as interleukin 1beta, that, by increasing neuronal excitability, may link fever and convulsion activity (Matsuo , 2006). Viral illnesses are the predominant cause of febrile convulsions. Recent literature documented the presence of human herpes simplex virus 6 (HHSV-6) as the etiologic agent in roseola in about 20% of a group of patients presenting with their first febrile convulsions. Shigella gastroenteritis also has been associated with febrile convulsions (Millichap , 2006). Febrile convulsions tend to occur in families. In a child with febrile convulsion, the risk of febrile convulsion is 10% for the sibling and almost 50% for the sibling if a parent has febrile convulsions as well. Although clear evidence exists for a genetic basis of febrile convulsions, the mode of inheritance is unclear (Audenaert , 2006).

Risk factors for febrile convulsions are as follows: Family history of febrile convulsions, High temperature, Parental report of developmental delay, Neonatal discharge at an age greater than 28 days Daycare attendance and Maternal alcohol intake and smoking during pregnancy (Two-fold). Presence of two of these risk factors increases the probability of a first febrile convulsion to about 30% (Vestergaard , 2002). There are two types of febrile convulsions: Simple febrile convulsions are usually over in a few minutes, but in rare cases they can last up to 15 minutes. During this type of convulsion, a child's whole body may convulse, shake, and twitch; their eyes may roll; and they may moan or become unconscious. Children can sometimes vomit or urinate (pee) on themselves during the convulsions. Complex febrile convulsions can last more than 15 minutes or happen more than once in 24 hours. They may also involve movement or twitching of just one part of the body (Gupta , 2016). During generalized febrile convulsions, the body will become stiff and the arms and legs will begin twitching. The child loses consciousness, although their eyes remain open. Breathing can be irregular. They may become incontinent (wetting or soiling themselves); they may also vomit or have increased secretions (foaming at the mouth). The convulsion normally lasts for less than five minutes. The child's temperature is usually greater than 38 °C (100.4 °F) (Symptoms of febrile convulsions, 2014). Patients with active convulsions should be treated with airway management, high-flow oxygen, supportive care, and anticonvulsants as necessary. Acute treatment such as rectal diazepam (0.5 mg/kg) and buccal 0.4-0.5 mg/kg) or intranasal (0.2 mg/kg) are effective and can be given at home for a convulsion lasting longer than five minutes (Sadleir , 2007) .

Materials & Method:

Experiment Designs:

The samples were divided into two groups: the control group with 30 samples and the infected group with 60 samples. The trial period is from 2 August until 15 November , 2022.

Sample Collection:

The questionnaire form for the study was designed and included all the required information. Five milliliters of venous blood were drawn from each participant. One milliliter was placed in the anticoagulant tube to determine Blood Groups and Rh Factor the as quickly as possible. Four milliliters were placed in tubes. These are left to curdle for 15 minutes at room temperature. The serum was separated by a centrifuge at 5000 rpm for five minutes. Serum was used to determine biochemical agents.

Biochemical and Physiological parameters:

Blood Group Test

Two drops of each child's blood (sample) were taken and pressed on a glass slide and the first drop was mixed with antiserum A (Anti A serum) and the second drop with anti-serum B (Anti B serum) and when there was a coagulation (Coagulation) of red blood cells for both types of serum, the child's blood type AB. If there is no agglutination in both types of serum, the child's blood group O .In the case of agglutination of antiserum A and non-occurrence in antiserum B, then the blood group of child A. If there is aflunation of antiserum B and does not occur in serum A, then child's B blood type.

Rhesus Test

Taken one drop of blood from each child (sample) and placed on a glass slide and mixed with antiserum D (Anti-D) when there is a similarity between the drop of blood and serum Anti D, the individual is of the positive type (Rh +) and if the trimony between the drop of blood and the anti-D serum, the individual is of the negative type (Rh-).

Determination of some electrolytes in blood serum (Na, K, Cl)

An electrolyte analyzer was used to determine the electrolytes. This method is based on the principle of ion selective electrode ISE In this study, the percentage of electrolytes in blood serum, namely sodium, potassium and chlorine, was measured with this technique

Statistical Analysis

The results obtained from the current study were analysed by using SAS 2001. The ANOVA test was used. The significant differences between the arithmetic averages were tested by using the Duncan multiple range test to compare between the groups, and the significance level of 0.05.

The Results and Discussion:

Blood groups:

The relationship between febrile convulsions, blood groups, The results of the study indicate the percentages of blood groups for the control group as follows: type A (40%), type B (10%), type AB (4.6%), and type O (45.4%). The percentages of the infected group were as follows: type A (25%), type B (21.7%), type AB (5%), and type O (48%). The percentages of the group of people with febrile convulsions showed a relationship between blood groups and febrile convulsions, as B carriers are more likely to suffer from febrile convulsions and type A carriers are less likely to suffer from febrile convulsions, while type AB and type O did not show a clear difference.

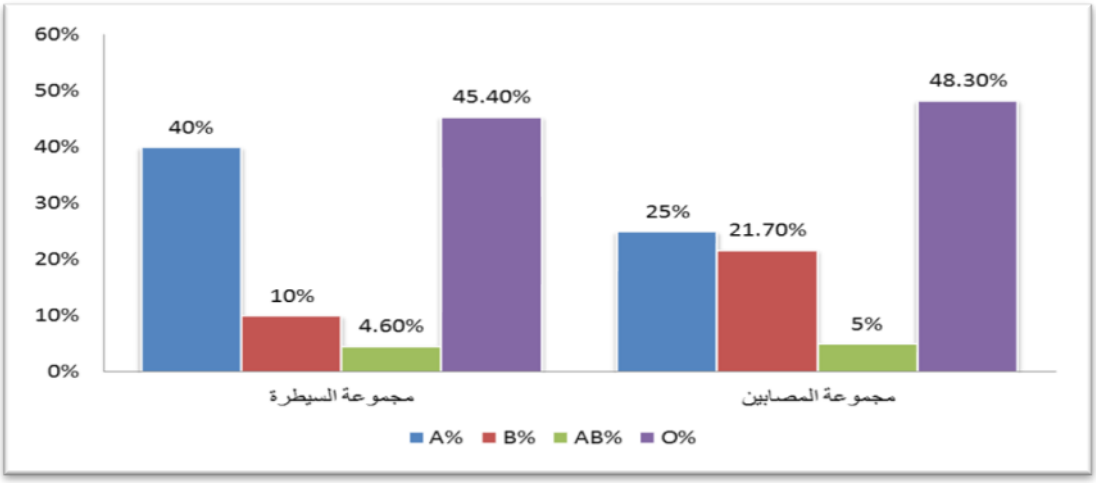

Figure 1: Shows the percentages of blood groups for the study group

The reason for the high incidence of Febrile convulsion in the B semester is due to the genetic factors that control the red blood cell antigens and their specificity and a series of genes, which can be alleles or closely linked on the same chromosome, and that the genes of blood group systems are autosomal, with the exception of some genes such as (XK, XG) located on the X and Y chromosomes, and the antigens can be integrated into proteins as polymorphism in the variation of the sequence of amino acids and glycoproteins. Sugary and fatty sugars (Vogel and Motulsky, 1986).

Rh factor:

The percentage of the Rh factor for the control group for the Rh+ factor was 86.7%, and for the Rh- factor, it was 13.3%. The percentage of infected people with the Rh+ factor is 90%, and the Rh-factor is 10%. The results indicate that there is no relationship between the Rh factor and febrile convulsions.

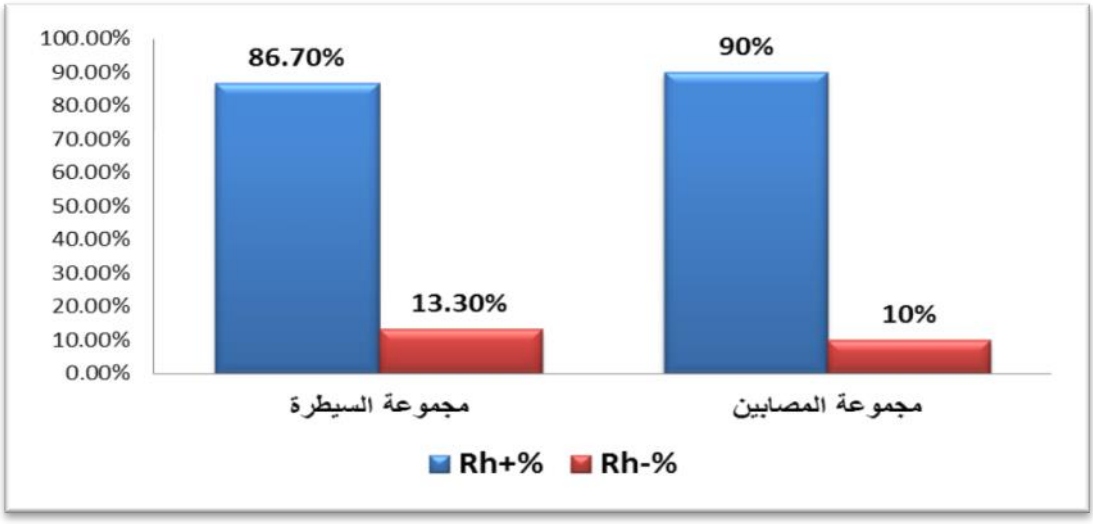

Figure 2: Shows the percentages of Rh factor for the study group

Concentration of sodium, potassium and chlorine in blood serum

The study showed a significant decrease (P≤ 0.05) in the level of sodium Na in the blood serum of the children of the affected group (132.96 ± 2.93mmol/L) compared to the level of sodium Na in the blood serum of the children control group (137.29 ± 1.48mmol/L). While the study showed no significant difference (P≥ 0.05) in the level of potassium K (4.004±0.405mmol/L) and chlorine Cl (99.93±2.32mmol/L) in the pediatric serum of the affected group compared to the level of potassium K (4.078±0.473mmol/L) and chlorine Cl (99.99±1.86mmol/L) in the control group's pediatric serum.

Table 1 : Shows the concentration of Na, K and Cl in the blood serum.

Parameters / group	Numbers	(Na mmol/L)	(K mmol/L)	(Cl mmol/L)
Patients	**60**	**132.96 ± 2.93 ****	**4.004 ± 0.405 ns**	**99.93 ± 2.32 ns**
Control	**30**	**137.29 ± 1.48**	**4.078 ± 0.473**	**99.99 ± 1.86**
P- Value		**P ≤ 0.0006**	**P ≥ 0.467**	**P ≥ 0.894**

This result may be due to the moderately elevated antidiuretic hormone Hormon, or vasopressin, during acute febrile infection, and as a result, hyponatremia relative to fluid retention may reduce the threshold of heat spasms. Also, excessive fluid intake can aggravate hyponatremia and promote heat spasms. Evaluation of serum sodium levels is recommended for children between the ages of six months and five years who are hospitalized with acute febrile disease. In cases of hyponatremia, it would be reasonable to limit fluid intake, unless the patient is dehydrated. The use of drugs that reduce urine production should also be avoided simultaneously. (Thoman . *et al*., 2004)

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