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A STUDY ON THE LEVEL OF ANTIOXIDANTS IN 1 TO 5 YEARS OF CHILDREN SUFFERING FROM JAUNDICE

Nayab Maryam[1], Areen Shahid[2], Ayesha Abubakar[3]

[1]Sharif Medical and Dental college, [2]WMO at RHC 6/G, tehsil Chishtian district Bahawalnagar, [3]Jinnah Hospital Lahore.

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Abstract:

Introduction: *Phototherapy is the most widely used form of therapy for unconjugated hyper-bilirubinemia. Its noninvasive nature, easy availability, low cost and occurrence of few side effects have initially almost led to the assumption that it is innocuous. Jaundice is not a disease in itself.*

Objectives of the study: *The main objective of the study is to find the level of antioxidant in children of age 1-5 years in Pakistan.*

Methodology of the study: *The data was collected from Jinnah Hospital Lahore during January 2018 to November 2018. We collected the data from children of age 1 to 5 years who suffering from jaundice fever. 5cc blood was drawn from vein for the analysis of antioxidants from blood serum. We find the level of antioxidants, GSH, MDA, CAT and SOD in blood serum.*

Results: *Serum MDA, GSH, GPx, Catalases and SOD concentrations were significantly lower after phototherapy than before it ($p < 0.05$). Conversely, serum TOS, lipid hydroperoxide levels were significantly lower than normal values. There were significantly positive correlations between serum total MDA and GSH.*

Conclusion: *It is concluded that there is a positive correlation between jaundice fever in children and serum antioxidants level.*

Key words: *Antioxidants, Level, Children, Fever.*

Corresponding author:

Nayab Maryam,

Sharif Medical and Dental College.

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INTRODUCTION:

Phototherapy is the most widely used form of therapy for unconjugated hyperbilirubinemia. Its noninvasive nature, easy availability, low cost and occurrence of few side effects have initially almost led to the assumption that it is innocuous. Jaundice is not a disease in itself. The yellow skin and eyes, which are the symptoms of jaundice, point at an underlying condition [1]. They indicate the presence of excessive amounts of bilirubin in the blood. Jaundice is a common occurrence in preterm babies. The liver is still in the developing stage, and the bilirubin does not get flushed out of the body regularly. The level of bilirubin usually goes down in two weeks after birth [2]. However, jaundice in toddlers and older children can occur due to several reasons. Finding out the exact cause of the condition is important to be able to treat it [3]. Here is a list of possible underlying conditions that cause jaundice in children. Each of these conditions directly or indirectly affects the levels of bilirubin in the body, causing yellow skin. Phototherapy is the most widely used form of therapy for unconjugated hyperbilirubinemia. Its noninvasive nature, easy availability, low cost and occurrence of few side effects have initially almost led to the assumption that it is innocuous [4]. The possibility that this may not be the case has been raised in several recent publications, which have shown that phototherapy is a photodynamic stress and can induce lipid peroxidation. Increasing appreciation of the causative role of oxidative injury and lipid peroxidation in the development of many severe diseases of the newborn has lent tremendous importance to lipid peroxidation and its possible causes [5].

Free radicals and related metabolites have attracted a great deal of attention in recent years. They are mainly derived from oxygen and are generated in the body by various endogenous systems, exposure to different physicochemical conditions or pathophysiological states [6]. Free radicals can adversely alter lipids, proteins and DNA, and have been implicated in pulmonary oxygen injury, intra ventricular hemorrhage, and retinopathy of prematurity, ischemia/reperfusion injury manifested as necrotizing enterocolitis, postasphyxial central nervous system injury, and acute tubular necrosis [7].

Objectives of the study

The main objective of the study is to find the level of antioxidant in children of age 1-5 years in Pakistan.

METHODOLOGY OF THE STUDY:

The data was collected from Jinnah Hospital Lahore during January 2018 to November 2018. We collected the data from children of age 1 to 5 years who suffering from jaundice fever. 5cc blood was drawn from vein for the analysis of antioxidants from blood serum. We find the level of antioxidants, GSH, MDA, CAT and SOD in blood serum.

Analysis of antioxidants

Sample was hydrolyzed 5 times in 0.25 M oxalic acid in boiling water bath, and then dialyzed against phosphate buffered saline (PBS). Protein content of each sample was determined by measurement of the absorption of UV light at 280 nm wavelength and calculated according to a standard curve.

Statistical analysis

Then all the data were statistically analyzed on SPSS version 17.0. SD, SE and means values of TAC were analyzed.

RESULTS:

Serum MDA, GSH, GPx, Catalases and SOD concentrations were significantly lower after phototherapy than before it ($p < 0.05$). Conversely, serum TOS, lipid hydroperoxide levels were significantly lower than normal values. There were significantly positive correlations between serum total MDA and GSH.

Table 01: Analysis of level of antioxidants

Variables	F	Sig.	t	df	Sig. (2-tailed)	Std. Error Difference
GSH	3.125	.089	-17.589	25	.000	.183414
			-20.466	24.857	.000	.157633
GPx	49.433	.000	7.334	25	.000	.083378
			5.585	9.129	.000	.109480
Catalase	.738	.398	1.532	25	.138	.419087
			1.722	24.802	.098	.373032
SOD	18.971	.000	-2.073	25	.049	.262729
			-2.664	18.165	.016	.204399
MDA	4.147	.052	1.590	25	.124	.480996
			1.811	24.983	.082	.764706

DISCUSSION:

Oxidative stress can be defined as increased formation of reactive oxygen species or decreased antioxidant defense mechanism [7]. Newborn's antioxidant resistance framework could be inadequate and it makes the connection between harm because of oxidative stress and new conceived pathologies more essential [8]. Untimely newborn children are at sure hazard from oxidative stress on the grounds that both endogenous and exogenous antioxidant barrier frameworks don't quicken in development until late in the third trimester[5]. Oxidative stress is a contributing element for tissue damage through the development of free radicals and responsive oxygen species (ROS) and receptive nitrogen species (RNS) prompting provocative cytokines which result in untimely birth. Increased levels of anti-oxidants and decreased activities of catalases can be correlated to enhanced lipid peroxidation and subsequent neoplastic transformation. Antioxidant enzymes which catalyze the conversion of reactive oxygen species to water include catalase (CAT), manganese containing superoxide dismutase (Mn-SOD) and copper and zinc containing superoxide dismutase, a mitochondrial enzyme that plays a key role in protecting the cell from oxidative damage [9].

Also, it has been demonstrated to scavenge superoxide Radical in a dose dependent manner. It was shown that plasma MDA concentrations in neonates with nonhemolytic jaundice were significantly higher than those in healthy infants. Ozture et al. reported that MDA concentrations were significantly lower after phototherapy than before it, and no significant correlation was found between plasma MDA and plasma bilirubin concentrations before and after phototherapy [10].

CONCLUSION:

It is concluded that there is a positive correlation between jaundice fever in children and serum antioxidants level. The lowest values shows that antioxidants are the important serum biomarker in the prognosis of jaundice.

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