

YENİ DOĞANDA HEMOGLOBİN A₁C

HEMOGLOBİN A₁C IN THE NEWBORN

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SUMMARY

We have tested hemoglobin A₁C In 10 newborns. Methods which were used in this study were ion exchange and affinity - chromatography for the separation and quantitation of glycosylated hemoglobin from whole blood. The amount of hemoglobin A₁C in newborns showed a significant difference depending on the methods used. Ion exchange chromatography result showed that the amount of HbA₁C of same newborns increased 3 - 4 times more with the affinity chromatography results.

ÖZET

10 yeni doğanda hemoglobin A₁C testi yaptık. Bizim, bu çalışmada glikozlanmış hemoglobinin kandan ayrılması ve miktarının tayini için kullandığımız metotlar iyon değişim ve affinite kromotografileriydi. İyon değişim Kromotografisi; bazı yeni doğan bebeklerin HbA₁C değerlerini affinite kromotografisi ile bulunanların 3-4 katı kadar artırdı.

INTRODUCTION

Nonenzymatic glycosylation is a condensation reaction between carbohydrate and free amino groups at the NH₂ - terminus or - amino groups of lysine residues of proteins (1). In vivo, HbA₁C is formed slowly and continuously throughout the life of the red cell (2, 3). The investigators suggested that HbA₁C can be formed by two complementary mechanisms : one that involves glucose transfer from a membrane glycoconjugate which and is operative during the first days of red blood cell intravascular life, and another that involves condensation of free glucose which slowly continues during the full condensation of free glucose which slowly continues during the full life span of the erythrocyte (4, 5).

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We are interested in the etiopathogenesis of macrosamia and our hypothesis is about the fetal high glucose appearance.

In order to test this hypothesis we decided to determine HbA₁C in macrosamia. However, many of the commercially available kits were not suitable for newborns. In this study we compared three recently developed different HbA₁C kits for newborns.

MATERIAL AND METHODS

Venous blood with EDTA - K3 was collected from ten newborns from newborn department of Cerrahpaşa Medical School of Istanbul University. For the quantitative determination of glycohemoglobin in blood were used a) for ion exchange chromatography, DEagle Diagnostics (protected by 2 U. S. Patent No. 4407961, DeSoto Texas USA 75123); b) for affinity chromatography Glyco Test II, GlyHb Assay Kits 44250 of Akron, Ohio USA 44321 ; c) for immunoassay DCA 2000 HbA₁C analyser of Bayer Diagnostics, Germany. Spektrophotometer, Philips, PU 8625 UV / VIS.

RESULTS AND DISCUSSION

The amount of hemoglobin A₁C in ten newborns can be found in table 1. During neonatal life young erythrocytes are abundant when compared to the infancy by in childhood. neonatal - hemoglobin A₁C levels were determine three different methods and the results were compared. The method that gave the best results was selected and discussed for further research on the maternal patients.

TABLE 1 : The amount of hemoglobin A₁C in ten newborns with different chromatography methods (for affinity chromatography: Pierce, Isolab and for ion exchange chromatography: Eagle).

Nr	AFFINITY	CHROMATOGRAPHY	ION ENCHANGE CHROMATOGRAPHY
	PIERCE (%)	ISOLABinc (%)	EAGLE (%)
1	3.09	2.88	17.30
2	4.92	4.61	13.90
3	4.30	3.92	13.80
4	3.96	3.83	13.00
5	3.48	3.49	11.90
6	3.50	3.71	11.90
7	3.36	3.42	12.80
8	4.42	4.13	12.46
9	3.13	3.27	12.90
10	3.13	3.24	14.10

Hemoglobin A₁C could not be measured with DCA 2000 HbA₁C Analyser This analyser is not suitable for the measurement of hemoglobin Alc in newborn. Fetal hemoglobin damaged the reaction for hemoglobin Alc in new - born. This instrument is good for hemoglobin Alc in adults.

The amount of hemoglobin A₁C is between % 3. 7. - % 6. 0 (7).

The results of ion exchange chromatography for measuring hemoglobin Alc are 3 - 4 times more than by affinity chromatography in newborns.

Furthermore the results of affinity chromatography for hemoglobin Alc in newborns showed normal value. Moreover, the affinity chromatography kits from different firms give the same results for hemoglobin Alc, for example the kits which we used (Pierce and Isolab).

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