Zeitschrift: Acta Tropica

Herausgeber: Schweizerisches Tropeninstitut (Basel)

Band: 43 (1986)

Heft: 1

Artikel: Medium term carbohydrate metabolism in subjects with sickle cell

anaemia: short communication

Autor: Ohwovoriole, A.E.

DOI: https://doi.org/10.5169/seals-313615

Nutzungsbedingungen

Die ETH-Bibliothek ist die Anbieterin der digitalisierten Zeitschriften auf E-Periodica. Sie besitzt keine Urheberrechte an den Zeitschriften und ist nicht verantwortlich für deren Inhalte. Die Rechte liegen in der Regel bei den Herausgebern beziehungsweise den externen Rechteinhabern. Das Veröffentlichen von Bildern in Print- und Online-Publikationen sowie auf Social Media-Kanälen oder Webseiten ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. Mehr erfahren

Conditions d'utilisation

L'ETH Library est le fournisseur des revues numérisées. Elle ne détient aucun droit d'auteur sur les revues et n'est pas responsable de leur contenu. En règle générale, les droits sont détenus par les éditeurs ou les détenteurs de droits externes. La reproduction d'images dans des publications imprimées ou en ligne ainsi que sur des canaux de médias sociaux ou des sites web n'est autorisée qu'avec l'accord préalable des détenteurs des droits. En savoir plus

Terms of use

The ETH Library is the provider of the digitised journals. It does not own any copyrights to the journals and is not responsible for their content. The rights usually lie with the publishers or the external rights holders. Publishing images in print and online publications, as well as on social media channels or websites, is only permitted with the prior consent of the rights holders. Find out more

Download PDF: 02.12.2025

ETH-Bibliothek Zürich, E-Periodica, https://www.e-periodica.ch

Department of Medicine, College of Medicine of the University of Lagos, Nigeria

Medium term carbohydrate metabolism in subjects with sickle cell anaemia

Short communication

A. E. OHWOVORIOLE

The syndrome of sickle cell anaemia (SCA) is characterized by a proneness to multiple organ infarctions following blockade of capillaries by sickled erythrocytes. No organ appears to be exempt from these infarctions in subjects with SCA (Edington and Gilles, 1976). It is conceivable, therefore, that infarctions of the endocrine pancreas might occur resulting in carbohydrate intolerance.

Few studies concerning carbohydrate tolerance in SCA have been reported (Addae and Odonkor, 1984). In this study we have examined the status of carbohydrate metabolism in the medium term in SCA, using a methodology that requires only a single blood collection, i.e. determination of glycosylated haemoglobin (GHb) levels (Goldstein et al., 1982).

Subjects, Materials and Methods

Thirty-two subjects with proven sickle-cell anaemia (29 subjects with HbSS, 3 with HbSC) and 20 normal subjects (haemoglobin electrophoresis pattern AA) were studied. The characteristics of the study subjects are summarized in Table 1. None of the subjects had a personal or family history of diabetes mellitus.

Venous blood was obtained from each subject once either in the fasting state or at least 2 h post-prandially. Blood sugar levels were determined by the method of Asatoor and King (1954) and GHb or haemoglobin A_1C (Hb A_1C) was quantified by the thiobarbituric acid colorimetric method as described by Gabbay et al. (1979). GHb values are expressed as A_{443} per 10 mg haemoglobin of the haemolysate ($A_{443}/10$ mg Hb).

Results are given as mean \pm standard deviation. The statistical significance of differences between mean values was determined by Student's 't' test and p \leq 0.05 taken as the level of significance of alpha.

Results and Discussion

The subjects with SCA and the controls were similar in age and sex distribution. However, the control subjects were significantly heavier (p < 0.01) (Table 1). The mean casual blood sugar level of the subjects with SCA was insignificantly lower than the one from the control subjects. The mean level of GHb in subjects with SCA is lower than that of the controls (Table 2). This difference is, however, not statistically significant (p > 0.05). Determination of glycosylated haemoglobin (GHb) levels is an efficient, convenient and cost-effective means of assessing the time averaged blood glucose level in the preceding couple of weeks (Goldstein et al., 1982).

The finding in this study is that the medium term averaged blood glucose level (as represented by the GHb level) of subjects with sickle cell anaemia (SCA) is not significantly different from that of normal subjects. This might suggest that the endocrine pancreas is exempted from the common

Correspondence: Dr. A. E. Ohwovoriole, Department of Medicine, College of Medicine of the University of Lagos, P.M.B. 12003, Lagos, Nigeria

Table 1. Characteristics of study subjects

Subjects (N)	M:F	Age (yr.)	Weight (kg)	Spot blood glucose (mg/100 ml)
Control subjects (20) Subjects with SCA (35)	12:8	23 (4.1)	60.5 (6.5)	62.2 (7.5)
	20:15	20.5 (3.5)	47.3 (6.2)	55.4 (6.8)

Values stated as mean (one SD)

Table 2. Levels of glycosylated haemoglobin in study subjects

Mean GHb A ₄₄₃ /10 mg Hb	Range	
0.171 (0.017)	0.148-0.201	
	A ₄₄₃ /10 mg Hb	A ₄₄₃ /10 mg Hb 0.171 (0.017) 0.148-0.201

vaso-occlusive infarction of SCA. This finding, however, needs confirmation although it is in agreement with two other reports or oral glucose tolerance test in sicklers (Addae and Odonkor, 1984; Okafor and Osamo, 1981). Both reports observed a flat glucose curve in these patients and attributed their finding to a possible intestinal malabsorption consequent upon vaso-occlusive infarction of the intestinal villi. However, no workers have reported villous infarction in sicklers and flat glucose curves are common in normal subjects (Tullock and Patel, 1969; Sisk et al., 1970).

More detailed studies of the exocrine and endocrine pancreas as well as related target endocrine organs are needed before any definitive conclusions about carbohydrate metabolism and pancreatic beta cell function in particular can be made in the subject with SCA. However, evidence from this study and others does not suggest that carbohydrate intolerance is a problem in sicklers. The rarity of diabetes mellitus in sicklers might further support this contention.

Acknowledgment. I thank Professor T. O. Johnson for the provision of facilities, Professor O. O. Akinyanju for allowing me to study his patients with sickle cell anaemia and Mr. Joseph Olorondu and Miss Bola Newton for their technical assistance.

Addae S. K., Odonkor P. O.: A review of some aspects of endocrine function in sickle cell disease. West Afr. J. Med. *3*, 63–70 (1984).

Asatoor A. M., King E. T.: A simplified colorimetric blood sugar method. Biochem. J. 56, 94–96 (1954).

Edington G. M., Gilles H. M.: Pathology in the tropics, p. 414–453. English Language Book Society and Edward Arnold (Publisher) Ltd., London 1976.

Gabbay K. H., Sosenko J. M., Baruchi G. A., Minisohn M. J., Flückiger R.: Glycosylated haemoglobins: increased glycosylation of haemoglobins A in diabetic patients. Diabetes 28, 337–340 (1979).

Goldstein D. E., Parker K. M., England T. D., England J. E., Wiedmayer H., Rawlings S. S., Hess R., Little R. R., Simonds J. F., Breyfogle R. P.: Clinical application of glycosylated haemoglobins measurements. Diabetes *31* (Suppl. 3), 70–78 (1982).

Okafor L. A., Osamo N. O.: Pancreatic endocrine function in sickle cell anaemia. West Afr. J. Med. *1*, 9–12 (1981).

Sisk C. W., Burnham C. E., Stewart J., McDonald G. W.: Comparison of the 50 and 100 gram oral glucose tolerance test. Diabetes 19, 852–862 (1970).

Tullock J. A., Patel K. M.: Studies of normal carbohydrate tolerance in the Ugandan African. Trans. roy. Soc. trop. Med. Hyg. 63, 644–649 (1969).