

# Analysis of Haptoglobin Phenotype Polymorphism in a Mennonite Population of Northern Mexico

Cosme Alvarado-Esquivel,\* Joris Delanghe\*\*

\* Faculty of Medicine, Juárez University of Durango State.

\*\* Department of Clinical Chemistry, Ghent University Hospital. Ghent, Belgium.

Haptoglobin (Hp) is a serum protein with a number of biological activities.<sup>1</sup> Hp is expressed by a genetic polymorphism as three major phenotypes: 1-1, 2-1, and 2-2.<sup>1</sup> Hp polymorphism is useful as a genetic marker of human populations.<sup>1-4</sup> Geographical distribution of Hp phenotypes varies substantially among different countries and races.<sup>1-4</sup> In Mexico, studies about the Hp polymorphism among several populations have been performed.<sup>2-4</sup> However, no data is available about the Hp polymorphism in Mennonites. Therefore, we sought to determine the Hp phenotypes in 90 inhabitants of a Mennonite community of Durango State, Mexico. The Mennonite community explored consists of persons of white ethnicity only. There was not any evidence that these inhabitants were mixed with other local ethnic groups. Inclusion criteria for the study subjects were: 1) Mennonites; 2) 18 year and older; and 3) who accepted to participate in the study. Selection of Mennonites was performed randomly. This strategy was used to explore a representative sample of the community and to diminish the likelihood of including related individuals. Serum samples of all 90 Mennonites were analyzed for Hp phenotyping by means of a starch gel electrophoresis of hemoglobin-supplemented serum as described elsewhere.<sup>1,5</sup> Calculation of gene frequencies was performed by gene counting. Hardy-Weinberg equilibrium was evaluated by the  $\chi^2$  test. We found that 9 out of the 90 Mennonites (10%) had Hp 1-1 phenotype, 39 (43%) had Hp 2-1 phenotype, and 42 (47%) had Hp 2-2 phenotype. The Hp\*1 and Hp\*2 allele frequencies found in the Mennonites were 0.317 and 0.683, respective-

ly. Results are in close agreement with the Hardy-Weinberg equilibrium.

Mennonites are known to have German origin and, therefore, these populations could have comparable Hp allele frequencies. In this study, the 0.317 Hp\*1 allele frequency found in the Mennonite populations studied is not similar to that of 0.460 reported in Germans in Germany.<sup>1</sup> Further studies should confirm this finding. Our results might point towards a strong founding father effect. The relatively high Hp\*1 allele frequency found points to a potential East-European influence in the Hp gene pool.<sup>1</sup> It is known that many Prussian and Flemish Mennonites accepted the invitation by the Russian empress Catherine The Great in the 18<sup>th</sup> century to settle in Russia. Possibly Russians might have joined the Mennonite communities in the 18<sup>th</sup> and 19<sup>th</sup> century, when many Mennonites wanted to keep their cultural identity by migrating to North America. Possibly, the Hp\*2 allele may have been protective in the 19<sup>th</sup> century migration of the Mennonites to Mexico. This is in agreement with the strong genetic pressure on the Hp polymorphism, which is in transient gene equilibrium.

We provide the first report about Hp allele frequencies among Mennonites. The results may be useful for a better understanding of racial differentiation and human migration.

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*Correspondence and reprint request*

**Cosme Alvarado-Esquivel, MD**

Facultad de Medicina. UJED.

Avenida Universidad y

Fanny Anitua

4000 Durango, Dgo.

Tel. y fax.: 0052-618 812-8009

E-mail: alvaradocosme@yahoo.com

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