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Effect on health of non-alcohol beer and hop supplementation in a group of nuns in a closed order

A. B. López-Jaén¹, P. Codoñer-Franch¹, J. R. Martínez-Álvarez², A. Villarino-Marín²
and V. Valls-Bellés¹

¹*Dpto de Pediatría, Obstetricia y Ginecología, Facultad de Medicina, Universidad de Valencia, Spain and* ²*Escuela de Enfermería, Facultad de Medicina, Universidad Complutense de Madrid, Spain*

Non-alcohol beer is a beverage that comes from fermentation of malting barley which is aromatised with hop flowers. This antioxidant capacity is due to the presence of flavonoids and melanoidines, which are substances that could have a protective role against processes in which reactive oxygen species are involved, as in age-associated pathologies.

The aim is to study the effect the supplementation of non-alcohol beer, in the same way as one of their components, has on oxidative metabolism and its relation to markers of cardiovascular risk and markers of inflammation in a group of advanced age nuns (nuns in a closed order).

The research was carried out on a group of nuns in a closed order ($n = 29$) of advanced age characterised by a homogeneous and ordered lifestyle, as well as a common diet for all their members. For 45 days, the subjects of the research ingested 500 ml/d of non-alcohol beer. After 6 months, this group was supplied with 400 mg/d of commercial hop (Elusan[®]) for 30 days.

Four blood extractions were carried out on each subject: (1) before the supplementation and (2) after the supplementation of non-alcohol beer, (3) before the supplementation and (4) after the supplementation of hop.

Lipidic metabolism parameters were determined, such as levels of triglycerides (TG), total cholesterol, LDL cholesterol, HDL cholesterol and oxidised LDL antibodies. With regard to oxidative damage to macromolecules, we have determined the levels of thiobarbituric acid reactive substances (TBARS) and carbonyl groups (CG) content in proteins. Levels of reduced glutathione (GSH) and α -tocopherol for the determination of endogenic antioxidant defence. In inflammation markers, the complement C3 and C4 fractions, the reactive C protein (PCR), interleukin (1 α , 6) and the TNF- α were defined.

After the supplementation of non-alcohol beer, we observed a significant decrease ($P < 0.05$) in total cholesterol levels of people who have a total cholesterol level of 240 mg/dl or more. As well, we observed that significant decrease in ($P < 0.05$) oxidised LDL antibodies. After the hop supplementation, we observed a significant decrease ($P < 0.005$) in TG levels, in ($P < 0.005$) total cholesterol levels and in ($P < 0.05$) oxidised LDL antibodies.

With regard to damage to macromolecules, after the non-alcohol beer supplementation the same way as after the hop supplementation, we observed a significant decrease in the determination of ($P < 0.005$) TBARS and in ($P < 0.005$) CG content. With respect to the content of GSH and α -tocopherol, both of them increased significantly ($P < 0.005$) at the end of the non-alcohol beer and hop supplementation.

With respect to inflammation parameters, after the non-alcohol beer supplementation, no significant changes were observed in the studied parameters. However, in the hop supplementation, there was a significant decrease in ($P < 0.005$) the complement C3 fraction, in ($P < 0.05$) the levels of PCR and in ($P < 0.05$) the values of interleukin-6.

The supplementation, in the context of a balanced diet, of non-alcohol beer or hop can contribute to the reduction of age-associated pathologies.