Pilot study about the CoQ10 absorption from Q1Q10 spray (produced by Celsus Ltd) by Gyula P Szigeti MD/PhD performed in University of Debrecen

Coenzyme Q10 (CoQ10) is produced by the human body and is necessary for the basic functioning of cells. Coenzyme Q1 (CoQ1 or NADH) is a natural substance found in most life forms and is necessary for energy production. CoQ10 and NADH are the key members of the electron transfer chain in mitochondria. The passage of electrons along the electron transport chain is coupled to the formation of ATP by the process known as oxidative phosphorylation. Coenzyme Q10 is not an antioxidant although it is characterized as such in all of the commercial available products.

Coenzyme Q10 is the oxidized form of this substance and an oxidant can never ever be an antioxidant. However, when CoQ10 is absorbed into the organism it is reduced by NADH and, thus, becomes an antioxidant. In other words, *NADH makes Coenzyme Q10 in the body into an antioxidant*; hence, *Coenzyme Q-10 needs NADH to become effective.* Additionally, CoQ10 concentrations may be increased with NADH supplements.

Coenzyme Q10 levels are reported to decrease with age and to be low in patients with some chronic diseases such as heart conditions, muscular dystrophies, Parkinson's disease, cancer and diabetes. Coenzyme Q10 is normally produced by the human body, although deficiency may occur in patients with impaired CoQ10 biosynthesis due to severe metabolic or mitochondrial disorders, not enough dietary CoQ10 intakes or too much CoQ10 use by the body. Depending on the cause of CoQ10 deficiency, supplementation or increased dietary intake of CoQ10 and the vitamins and minerals needed to produce CoQ10 may be effective. Prior to recent discoveries *CoQ1* is rather unstable and, hence, not capable of being absorbed by the intestines of the human body.

It would have been expected that this substance would be hydrolized in the gastric juice within a few seconds. The previously described problem is the cause why the sublingual spray form of CoQ1 and CoQ10 was chosen by Celsus Ltd. to maximize the absorption and optimize bioavailability of the CoQ1.

The aim of this study was to determine the absorbance and bioavailability of CoQ10 from Q1Q10 sublingual spray. The study was performed between July 1 and August 31 2010 in the University of Debrecen. Six healthy participants (age between 25 and 41 years) were observed based on the clinical study which was performed to determine the CoQ10 absorbance from Contox3 sublingual spray. However, our study was implemented with a CoQ10 absorbance test using Q1Q10 capsule from the same company, also.

We determined the absorbed CoQ10 from the plasma of participants using the standards published by Yamashita and Yamamoto in the *Analytical Biochemistry (1997)*. Unfortunately, we do not have useful analytical tool to determine the plasma CoQ1 content.

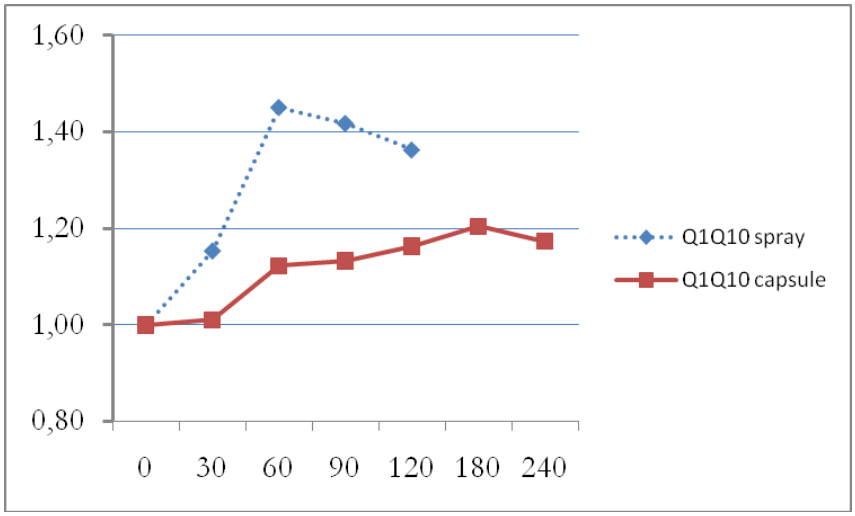

Figure 1. Changes of plasma CoQ10 content after application Q1Q10 spray (-◆-), or capsule (-■-) (normalized to control, x-axis in min).

First, we determined the absorption kinetics of the CoQ10 from Q1Q10 spray and capsule. The Figure 1. shows the representative normalized time kinetic curves after application of Q1Q10 spray or capsule. The slope of the changes of plasma CoQ10 content was faster and the peak of plasma CoQ10 content was significant higher after Q1Q10 spray application than after Q1Q10 capsule.

In the next step we determined the changes of the plasma peak CoQ10 content after the application of Q1Q10 spray and capsule (Figure 2.). The changes of the plasma peak CoQ10 was significantly higher after application of Q1Q10 spray (1.35±0.08, mean±standard deviation) than capsule (1.18±0.06) in every participant.

This means that the absorbance of CoQ10 was approximately 15 % more effective after spray than capsule.

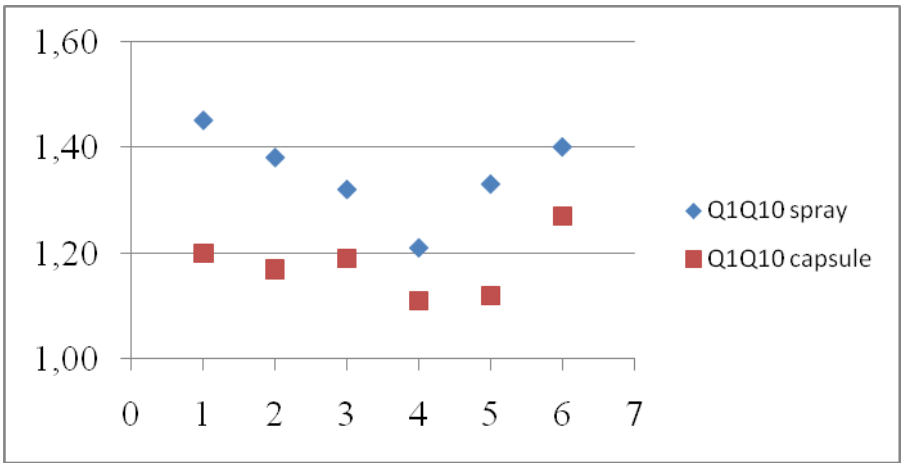

Figure 2. The changes of the plasma peak CoQ10 content after the application of Q1Q10 spray (-◆-), or capsule (-■-) in six participants (normalized to control, x-axis No. of participant).

SUMMARY OF OUR FINDINGS:

The Celsus Ltd. finally produced a CoQ10 containing food supplement where the CoQ10 has an increased bioavailability. The spray form of their products is more effective than capsule.

NOTE:

It seems that the changes of plasma peak CoQ10 content was poor, but do not forget that all participants are healthy with a normal plasma CoQ10 content.

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