

DATA SET 5

EXPLORE 1C LESSON 18



Study 1

Glucose metabolism during leg exercise in man

Publish Date: December 5, 1971

Journal: Journal of Clinical Investigation

Authors: Wahren J, Felig P, Ahlborg G, Jorfeldt L.

Link: <https://doi.org/10.1172/jci106772>

Overview of the Study

The purpose of this study was to examine the role of liver glycogen in maintaining blood glucose homeostasis during exercise of varying workloads. Liver glycogen is utilized as storage for excess glucose molecules that the body may need for various processes. Liver glycogen can be broken down to release glucose molecules, which can be used in the liver itself or can travel into the hepatic vein and then to the bloodstream to be used by other organs. Glucose is a source of energy for all cells of the body.

To study how exercise impacts liver glycogen breakdown and release of glucose into the bloodstream, scientists recruited four healthy adult males who were in good physical shape though not training for any type of competition. After an overnight fast, participants completed 40-minute workouts on an upright cycle at specifically assigned workloads of 400 kg-min/min, 800 kg-min/min, and 1200 kg-min/min.

To take measurements of levels of blood glucose leaving the liver, catheters were placed in the hepatic veins leaving the liver. Blood samples were collected at rest prior to exercise and every five minutes during the exercise period.

Note: The study and the caption from the figures below use the term “splanchnic glucose production.” This term can be interpreted as glucose that is broken down from liver glycogen and leaves the liver.



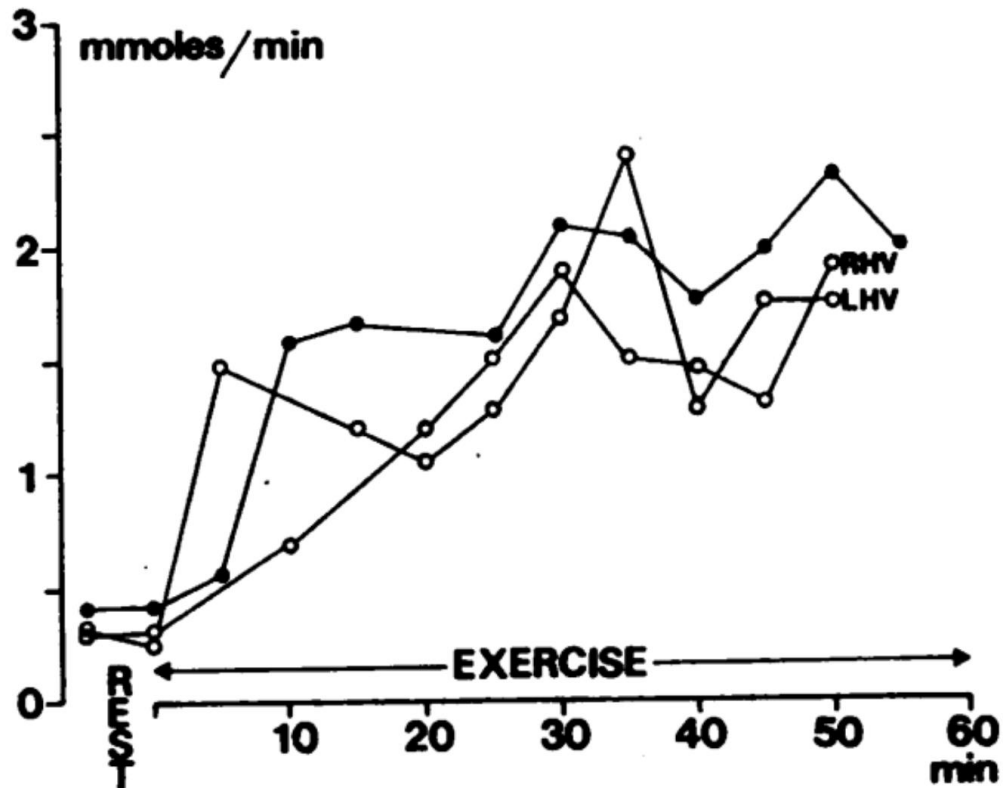


Figure 1: Splanchnic glucose production at rest and during exercise at 1200 g-m/min (high intensity) in subject G. C. on one occasion (filled circles) and three months later (open circles), when glucose production was estimated from measurements on blood from both a right (RHV) and a left (LHV) sided hepatic vein.

Study 2

Glucose metabolism during leg exercise in man.

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Authors: Wahren J, Felig P, Ahlborg G, Jorfeldt L.

Link: <https://doi.org/10.1172/jci106772>

Overview of the Study

This data was taken from the same study, using the same methods as was shown in Study 1.

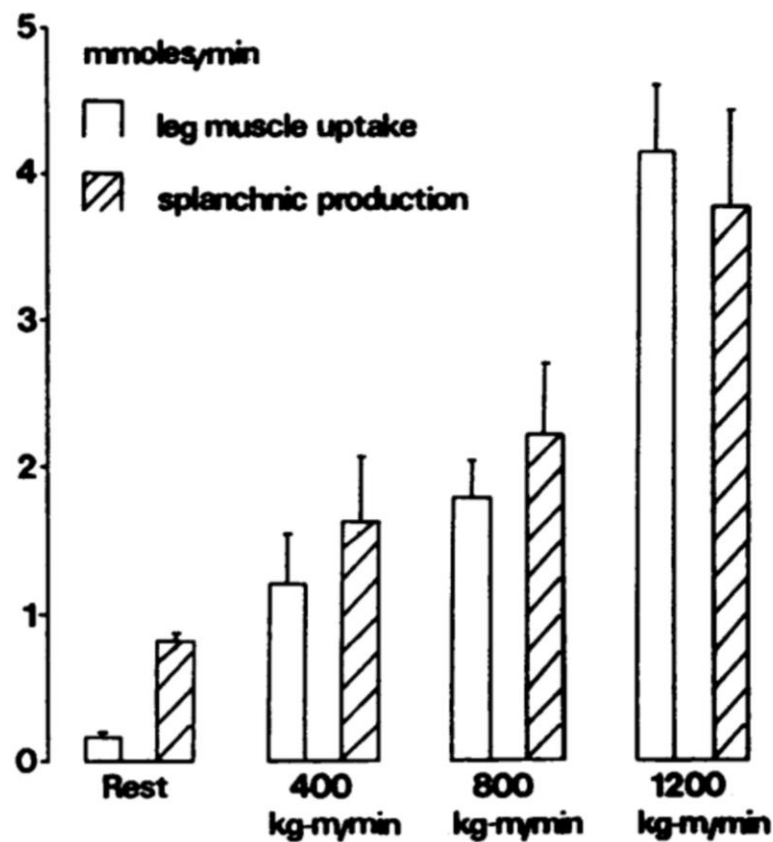


Figure 2: Comparison of estimated glucose uptake by the legs and splanchnic glucose production in subjects at rest and after 40 minutes of exercise at various work intensities (mean \pm SE).