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## The “5000 metres above sugar level” project — “Alps 2015” expedition

### Projekt „5000 metrów nad poziomem cukru”

Physical exercise is firmly incorporated in the management of type 1 diabetes (T1DM), due to multiple recognized beneficial health effects. It improves insulin sensitivity, reduces cardiovascular risk factors, improves quality of life and reduces mortality [1, 2].

Mountain trekking is one of the forms of physical activity that should be highly recommended for individuals with T1DM. The day-long trip may increase insulin sensitivity for another few days. Mountain trekking includes interval exercise which is considered to be more effective in controlling glucose patterns than aerobic or resistance exercise alone [3].

Unfortunately, very little guidelines exist concerning diabetes management during mountain trekking (for instance taking previous level of general physical activity under consideration). In addition, an increasing number of people with T1DM choose high altitude trekking. This form of physical exercise creates specific challenges for individuals with T1DM, because many physiologic processes, including glucose metabolism, energy expenditure, and insulin requirements, differ

at altitude compared with sea level. In addition, all individuals at very high altitude are at risk for developing acute mountain sickness (AMS). This is why it is difficult to predict individual insulin requirements and glucose profiles in response to exercise at medium to high altitude in individuals with T1DM [3].

The “5000 meters above sugar level” initiative is designated to at least partially address those issues.

The first step that took place between September 12<sup>th</sup> and 14<sup>th</sup> was to trek the route of “Gorce Mountain Marathon” — we did it in two days with more than 20 participants with Type 1 diabetes. The second step was winter mountain trekking and camping — described previously [4].

The last step so far was the “Alps 2015” trekking tour. We aimed to reach the attitude of 3,500 meters in the group of 23 patients with type 1 diabetes of very different background as far as the physical activity in concerned. All the patients were asked to make detailed notes concerning insulin dosing modifications and food consumed. In addition lactate level was measured in the course of the expedition, the glucose meter and insulin pumps data were downloaded. Due to the very bad weather conditions we reached only the attitude of 3,019 meters, but still we consider it to be a success. We did not have a single case of either severe hypoglycaemia of metabolic decompensation; we gained lots of experience, all participants declared to have a very good time. The detailed data gathered during the expedition are still to be analysed.

Of note, our group was guided by Mr Maciej Pawlikowski, one of the best mountaineers of the world.

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He is best known for the first winter ascent of Cho Oyu (8,201 metres — 26,906 ft., above sea level).

The plans for the future include:

- Winter camp 2016 — with training of trekking on icy ground;
- Ararat 2015 — June/July 2016 — the final step of our project aiming to climb Mount Ararat (5,137 m — 16,854 ft. — above sea level).

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