

## 30th Pelikan's Seminar – Medical Aspects in Mountain Medicine

### Conference Report 2019

The Czech Society for Mountain Medicine and the Medical Commission of the Czech Mountaineering Association organized on 26th–27th October 2019 the 30th jubilee Pelikan's seminar, the traditional conference focused on mountain medicine. This time the event took place in Jeseníky mountains, in the hotel Petr Bezruc in Malenovice, a town at the foot of Lysa mountain.

On Friday night, before the main program, **Dr Igor Hermann** took us virtually to **Alaska: 150 km with a backpack**. As usually, he accompanied his stories with beautiful photographs.

The main program was launched on Saturday morning, when the introductory word was presented by **Dr Jana Kubalova**, the Chairperson of the Medical Commission of the Czech Mountaineering Association and the Vice-President of the Czech Society of Mountain Medicine. She delightedly noted that this annual conference have come to its 30th anniversary and she also conveyed greetings from the President of Czech Society of Mountain Medicine Dr Ivan Rotman.

1. The first block of lectures was dedicated to *Mountain Rescue: reality and practice*. The first lecture **Practical rescue in the mountains—where the Alpenverein should work, but it does not** was delivered by **Michal Kleslo**. He is an experienced expedition leader and he has already organized numerous trips in European, Asian and African mountains. He mentioned a long list of problems with rescue services, especially in remote areas where mountaineers cannot rely on standard organized help and even a representative from a travel insurance company is not a guarantee of a rescue operation. It is essential to read the terms and conditions for a travel insurance thoroughly before traveling. Mr. Kleslo formulated following basic recommendations for expeditions and travel insurance:

- some travel insurance contracts work perfectly within Europe, but they are insufficient for expeditions into remote areas;
- some travel insurance companies do not provide 24 hour phone assistance, they do not provide assistance for organization of the rescue itself, or for repatriation, they only pay the expenditure;
- for the rescue services in foreign (remote) countries, it is vital to provide a cover letter issued by the travel insurance company certifying the amount of money the mountaineer is insured for;
- each group of mountaineers should have sufficient means of communication and should not rely solely on GSM mobile phones, but alternatively use also satellite phones;
- in former Soviet Union countries, it is essential to have at least one member of the group who is fluent in Russian language;
- the knowledge about local emergency phone numbers is crucial because the number “112” does not work worldwide;
- useful is to have a contact person in the remote destination (e.g., a mountain guide or a member of an alpine club), the mountaineers can leave by them a copy of a passport and a travel insurance card, in case of an accident.

2. **Dr Jiri Zak** continued with his juridical lecture about **The Amendment of the Law on safety in the mountains and a case analysis of a tourist fatal accident**. Currently in the Czech Republic, the government is preparing an amendment of the Act on Tourism, in which a separate section on Mountain Tourism should improve the safety in the mountains. The crucial debated topics are: (1) the rules for skiers on the ski slopes; (2) the possibilities in strengthening the competences of the Mountain Rescue Service; (3) the possibilities in strengthening the competences of the municipalities, which would e.g., allow them to ban entry into avalanche areas. Dr Zak presented the way of application of the current law on a case of a tourist fatal accident in the mountains.

3. The next section on *Hypothermia, analgesia and high altitude medicine* was opened by **Dr Farkas** and his **Practical aspects of ECMO in accidental hypothermia therapy**. At the beginning, he thoroughly described the basic structure of the ECMO machine (Extra Corporeal Membrane Oxygenator). Afterwards, Dr Farkas presented a case of a Polish female tourist who suffered severe hypothermia in High Tatras after a night she was forced to bivouac in temperatures below zero. The next day, when she was rescued, she was unconscious, with body temperature of 17 °C and heart rate 17 beats per minute. During ongoing resuscitation with mechanical chest compression device, she was transported to ECMO center in Kosice, Slovakia, where veno-arterial ECMO was commenced. The whole process was presented on number of videos, including one documenting a very good outcome—the patient was able to be discharged from the hospital 11 days after the accident. Dr Farkas also included some interesting facts: because of the severity of the primary condition, only approximately half of the patients survive; higher survival rate have slim people and children due to rapid cooling of the brain, which is neuroprotective.

4. The situation in Czech ECMO centre was presented by **Gabriela Hodkova**, who is a perfusionist in the General University Hospital in Prague. Her lecture **Hypothermia and ECMO—current options** took us to a centre where 50 to 60 patients annually are treated by ECMO. However, hypothermia is a minor indication for this treatment (mainly they have cardiac arrest patients due to heart diseases). This team is also able to transport patients on ECMO machine from distant hospitals, including paediatric patients.

5. Also **Dr Hana Kubinova**'s topic was related to emergency medicine in mountain areas and as a chief physician of the Mountain Rescue Service in the Czech Republic, she presented the experience with **Volatile analgesia in the field—rebirth of Methoxyflurane in the Czech Republic**. According to the Czech law, a member of the Mountain Rescue Service (who is not a paramedic) cannot administer any drugs; they can only help the patient with administering of drugs they have for their regular or emergency use (e.g. salbutamol for inhalation, or adrenaline injection "Epipen"). However, the most common symptom in the mountain rescue is a pain and painkillers cannot be administered without a doctor, who may get to the scene with a significant delay. So the aim was to find an analgesic drug which could be administered without a doctor, a painkiller which is safe and easy to administer. Thanks to that, Methoxyflurane, a volatile anaesthetic removed from the anaesthetic drug portfolio due to its nephrotoxicity, started to be distributed again in a form suitable for a field use. This drug has been tested by the Mountain Rescue Service in Jizerske Mountains, following a thorough training and development of a Methoxyflurane Administration Card, which includes the relevant past medical history (including renal and liver diseases, reaction to volatile anaesthetics and allergies), the dose of the drug and a pain scoring scale (VAS - Visual Analog Scale); this card becomes a part of the medical record of the patient. Dr Kubinova demonstrated the positive experience with Methoxyflurane on a case of an elderly skier who suffered a hip fracture on a ski slope and had a very good pain relief.

6. The section about *Avalanches* was opened by **Dr Jan Pala** with his annual **Selected avalanche accidents and skier injuries in winter season 2018/2019**. This particular season was rich in snow and the number of avalanche fatalities in Europe — one hundred — corresponds with the long-term average. Most of the avalanche accidents occur during avalanche danger scale level 2–3, accidents occurring on level 1 usually happen at the beginning of the season. What was unusual for this season was that the snow coverage stayed till late summer, so the last avalanche fatality in Tirol took place on 1st June 2019. This situation also caused a fatal accident of two American tourist who took a summer route on skies, which led them into a steep avalanche slope and they triggered an avalanche. In the USA, there also happened another accident where 6 skiers were involved, two of them attempted to activate their avalanche bags unsuccessfully. According to the statistics, 12 % of these bags fail in activation.

7. The avalanche season in Slovakia was presented by **Dr Ivana Sikulova** in her lecture **Avalanche accidents in Slovakian mountains in the season 2018/2019**. There were 10 avalanche accidents in Slovakia, which is lower number compared to the previous season which had 18 accidents. Seventeen people got involved in these accidents and it is known that four of them were ski-mountaineers, three were climbers, two of them were tourists and there was also one snow-boarder involved. None of the three people who were completely buried survived, partially were buried two people, from whom only one survived. Most of the accidents took place in High Tatras (7 accidents) and mostly during the second level of avalanche danger. Then Dr Sikulova presented two very interesting cases in more details.

8. **Dr Tomas Obtulovic** tried to answer a question how to prevent avalanche accidents in his presentation **Simply go skiing... My risk management on the snow**. As he has just started his 17th winter season in the mountains, he analyzed the crucial steps especially in the tour planning and the important role of being able to terminate a trip when the situation requires it.

9. As a part of the previous block of lectures about the high altitude medicine, **Dr Kristina Höschlova** presented **The effect of breathing exercises on high altitude adaptation**. The successful adaptation to high altitude corresponds with an increase of oxygen delivery into the body tissues. People with better adaptivity tend to hyperventilate more than those who struggle to acclimatize. The effect of breathing exercises is well known for centuries, but now the researchers are trying to prove its positive effect in numerous studies. Well known is the Wim Hof's technique, which has been used by a group of tourist with different level of fitness during a climb to Mt Kilimanjaro; all of them reached the summit. Dr Höschlova then presented a technique used by a tai chi master who works with pilgrims traveling to Mt Kailash reaching an altitude over 5000 meters above sea level. She documented some of these techniques on videos. These breathing exercises are useful to be practiced weeks before a trip to high altitude in order to facilitate the acclimatization, or they can be used as a rescue method in case of very mild symptoms of acclimatization difficulties.

10. After that **Dr Kristina Höschlova** opened another session focused on *Education and injuries* and informed us about **The education in mountain medicine**. She presented the new Mountain Medicine Course for Mountaineers, which took place this year and was very successful. She also invited for registration for the course for doctors, paramedics and medical students for the year 2020.

11. The topic of accidents was opened by **Petr Brincek** and his lecture **The common mistakes and injuries on via ferrata**. First of all, Mr. Brincek mentioned some basic physical principles involved in via ferrata climbing, including the fall factor. On regular basis, we can see very risky behavior on via ferratas, for example free climbing without proper via ferrata set, the use of home-made sets, incorrect connection between the set and the harness, or bypassing of the set. He demonstrated many of these mistakes on photos and videos.

12. In the next lecture, **Dr Tomas Obtulovic** presented some interesting facts about **The lightning — an underestimated danger**. However, he also shared his **Memories of Tomas Roubal and mountain medicine in “Montana” magazine**. Sadly, Tomas Roubal, an extraordinary climber and a publisher of a climbing magazine, died this summer in Norway while climbing a famous rock wall Trollveggen.

The official theoretical part of the conference was followed by the evening program, which included **Dr Ivana Sikulova’s Memories of Davo Karnicar**, an unbelievable extreme skier who died recently after an accident at home, not in his beloved mountains. **Dr Tomas Obtulovic** presented interesting photos from **Verwall: unknown mountains between Tirol and Voralberg region**.

13. The second day of the conference was opened with a section on *Injuries* and the traditional lecture about **Climbing injuries in the Czech Republic—overview and case reports** by **Dr Lucie Bloudkova**. Constantly, there is a trend of increasing number of members of the Czech Mountaineering Association, mainly those younger than 18 years. Among these climbers, we record most of the climbing injuries as well. This can create slightly skewed data towards younger injured climbers; the reason is that very likely most of these injuries happen during events organized by climbing clubs, so the accidents have to be reported. There is also an increasing number of accidents on climbing walls in gyms, probably due to growing popularity among inexperienced climbers who see climbing only as a type of a fitness activity and their knowledge about the safety aspects is very poor. The gyms are quite crowded and the communication between the climber and the belayer can be also a source of hazardous situations. Then Dr Bloudkova presented several cases from climbing gyms and from rock climbing areas, including several illustrative photos.

14. **Three new cases from the climbing gym and how we can prevent further accidents** were presented by **Dr Jana Kubalova**. According to the CCTV camera recordings and also from the experience from the climbing walls, the most problematic aspect of climbing there is still belaying. One can see the same mistakes repetitively. Some of the accidents are recorded thanks to an obligatory “Injury record” which is kept by all the gyms. However, the visitors do not always record their accidents, especially if they suffer only a minor injury; usually they do not inform the gym staff at all. Dr Kubalova presented three CCTV video recordings of accidents, which provoked very lively debate about the responsibility of the owner of the gym and the responsibility of the climbers as well.

15. The number of injured Czech mountaineers and tourists in alpine statistics were explored by **Dr Tomas Obtulovic** in his **Stupid Czechs again! What is the reality?** Czech tourists are frequently mentioned in Austrian newspaper and magazines as people with very hazardous behavior and who suffer from injuries very often. However, according to the statistics of the Austrian Administrative Board for the Alpine Safety (Österreichisches Kuratorium für Alpine Sicherheit), in ten years (2008-2018) there were over 74 thousand people injured in the Austrian mountains, but only 1,3 % of them were Czech citizens, which is lower number than of tourists from Germany (33 %), Netherlands (4 %), or Switzerland (2 %). Also, from total nearly 3 000 fatalities, only 49 of them were from the Czech Republic and 12 of these Czech tourists died in an avalanche. This means, Czech citizens were definitely not “leading” the Austrian alpine statistics; on the other hand, there is definitely a room for improvement.

16. The last theoretical section was devoted to *Climatic changes—should we be worried in the mountains?* This hot topic was opened by **Dr Jan Pala** with his presentation **Climatic changes and the increased objective danger in the mountains**. The increase of the planet temperature due to urbanism and industry is a widely discussed issue; however, in the last 600 000 years the Earth has gone through six episodes of a significant loss of glaciation. Moreover, there are parts of the planet where we can see increase of the amount of glaciers. The ice and snow in small continental glaciers, which receive a lot of publicity also due to the popularity of mountain activities, form only 3% of the total glacier mass. However, even Dr Pala documented this phenomenon on his photos from Iran mountains and from Sölden in Austria.

17. **Ladislav Sieger** followed up with his interactive lecture about the **Lightning—we don't we mind high voltage?** Thunder storms are feared hazards in the mountains and tourist should know several basic rules they should follow in case of a lightning:

- mountain boots should have a rubber sole, which has a high resistance to the electric current;
- it is recommended not to sit close to a wet rock, it is better to sit in the middle of a cave, a bit further from the inlet and from the walls, ideally on a backpack;
- not to hide under trees on a plain;
- not to hide even in a tent with metal bracing, which is usually also wet;
- in case you are in the water, get on the bank as soon as possible;
- if you are in a group of people, it is better to spread with a distance of at least 3 meters between each other;
- in an opened field, it is recommended to stay close to the ground;
- keep your feet close to each other in order to eliminate the "step voltage";
- on via ferrata, it is essential to get off the metal rope as soon as possible;
- during rock climbing, it is wise to throw away all metal equipment—it does not attract the lightning, but it can cause burns;
- it is wise to turn off the mobile phone—it does not attract the lightning, but in case of lightning strike of the phone, the electric circuits get damaged and the phone could not be used in order to call for help.

18. The lightning topic was concluded by **Dr Jana Kubalova** with her presentation **Giewont—the mass casualty**. She described an accident which occurred on Polish mountain Giewont, (1895 m) which is a national peak with a 15 meter high cross. It is an undemanding trip, easy to climb, only short parts are secured with chains. However, the mountain is often very crowded, so it is organized as a one way footpath. On 22nd August 2019, due to a thunderstorm there was a mass casualty with 157 injured tourists, 4 people died (2 of them were children). The rescue operation was well organized and it took only 4 hours to evacuate all the tourist from the area and more than 200 paramedics were engaged with 5 helicopters and a close mountain hut was turned into a field hospital. This accident provoked a vivid discussion about the organization of the rescue operations in the mountains.

Finally, Dr Kubalova concluded the theoretical part of the 30th jubilee Pelikan's seminar, acknowledged the contributors and invited all the participants to the next 31st Pelikan's seminar, which will take place in the Czech Republic again, this time in November.

After the official theoretical part of the seminar, the participants had a unique opportunity to see **Ladislav Sieger's** practical workshop on **Knots—not only for climbing**, on **Water purification** and on **How to make a fire**.

Written by Dr Jana Kubalova and Dr Lenka Horakova.