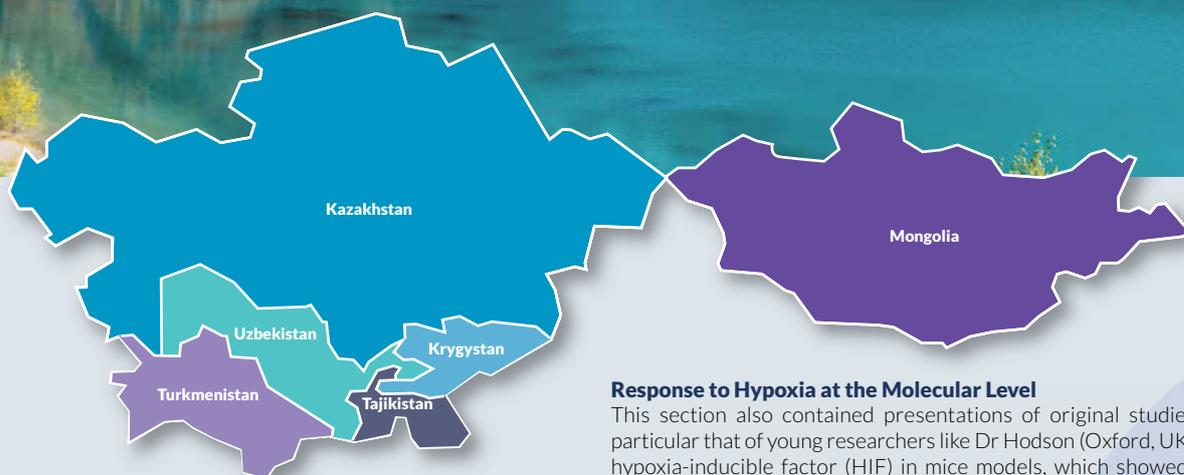


PVRI Central Asia & High-Altitude Report 2016

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Cardio-Pulmonary Acclimatisation and Adaptation to High-Altitude: from Physiology to Clinical Practice. The High-Altitude Task Force meeting took place on 24-28 September 2016, in Cholpon Ata (Lake Issyk-Kul), Kyrgyzstan.

Background and Aim

The Issyk-Kul Leh Symposium took place on 24-28 September 2016, in the Karven Four Seasons Hotel on the shore of Lake Issyk-Kul, Kyrgyzstan. Its aim was to bring together the knowledge and information gathered from recent advances in high-altitude research. The Symposium followed the tradition of three previous high-altitude medicine conferences held in Leh, Ladakh (India) from 2010 onwards. As in previous years, the conference was held in a highland area to draw attention to the needs of highland populations, as well as individuals travelling to altitude. Additionally, this was the first opportunity for high-altitude researchers from Central Asia to take centre stage, be directly involved in the preparations for the conference as well as present their own original research for discussion with their colleagues from all over the world (UK, USA, India, Germany, Switzerland and others). Thus, throughout the Symposium, an atmosphere of constructive dialogue and maximum engagement of young researchers was maintained.

Research Presentations

An international faculty of outstanding experts in various fields of high-altitude physiology and medicine presented original research and up-to-date reviews on selected topics.

Hypoxia and Genetics

The first full day of the Symposium was opened with a presentation from a young researcher, Dr Eichstaedt (Heidelberg, Germany), on genetic and phenotypic adaptation of populations to altitude. More lecturers reported on genetic mutations in Kyrgyz highlanders, underlining the necessity of further research on this particular population, since (compared to Andeans and Tibetans) it is a recent newcomer to high-altitude; thus, processes of human adaptation to this environment are a particularly interesting and important study subject.

Response to Hypoxia at the Molecular Level

This section also contained presentations of original studies, in particular that of young researchers like Dr Hodson (Oxford, UK), on hypoxia-inducible factor (HIF) in mice models, which showed the importance of HD2/HIF-2 in ventilator acclimatisation. Connected to this was the session on hypoxia and pulmonary and systemic circulation, with presentations by Japanese researchers (Dr Mizuno and team) on micro-RNA profiling of models of pulmonary hypertension, and German colleagues (Dr Pak, University of Giessen), on the reaction of pulmonary vasculature to hypoxia.

Blood at Altitude

This diverse session covered blood diseases and conditions connected with response of the blood to hypoxic conditions, such as those at high altitude (Dr Muckenthaler, Heidelberg). It included a retrospective of treatment of aplastic anemia in Kyrgyzstan by the highly respected academic, A. Raimjanov (Kyrgyzstan), to unique research on genetic diseases that cause unregulated hypoxic response in normoxic conditions (Dr Gordeuk, USA/Russia), to studies of factors that influence hemoglobin concentration (Dr Prchal, USA).

Good Clinical and Research Practice and Education

Several lectures were specifically dedicated to transferring knowledge and experience of established researchers to their young colleagues. Specifically, methodology of study protocols, writing of scientific papers (Dr Russi, Switzerland), as well as reports on successful educational programmes (Dr Schoch, Switzerland) were presented.



Altitude Related Illness in High-Altitude Travellers

Since millions of people travel to high-altitude every year for work or leisure, one of the most important aspects of this Symposium was the exchange of knowledge and discussion of the newest research on acclimatisation, as well as the detection and prevention of altitude-related illness (presentations by Dr Roach, USA; and Dr Burtscher, Austria).



COPD: Causes, Clinical Presentation at Low and High-Altitude

Particularly interesting were the presentations of original research borne out of the recent Swiss-Kyrgyz cooperation projects, made by young researchers who participated in those studies (eg, M. Furian and M. Lichtblau, Switzerland, M. Mademilov and B. Estebesova, Kyrgyzstan).

Health Problems in Highlanders

Problems related to insufficient adaptation of the human body to altitude can severely impact the quality of life of high-altitude residents. Presentations by Kyrgyz and international researchers (Dr S. Ulrich, young scientists - B. Osmonov, S. Müller-Mottet) were concentrated on prevalence and treatment of diseases related to altitude, such as high-altitude pulmonary hypertension (HAPH), as well as other diseases tied to the lifestyle of highlanders (eg, prevalence of COPD and indoor pollution due to biomass heating).

Tuberculosis in Different Settings

Tuberculosis, particularly multi-drug resistant (MDR) TB, is a grave problem for many developing and emerging societies, and Kyrgyzstan in particular. Data presented by Dr Isakova (Kyrgyzstan) show the large extent of the problem, particularly in the penal system of the country, while Dr Schoch (Switzerland) shared valuable experience on early diagnosis options for TB in developing countries.

Altitude Physiology in Early Life and During Sleep

Drs Reiss and Merkus, both established researchers from the Neonatology section of the Erasmus Medical Centre (Netherlands), provided their insight into the newest research on the effects of altitude on the foetus and the newborn child.

Physiology at the Extremes and Mountain Medicine

Athletes and persons travelling to more extreme altitude conditions deserve special attention, which is why the conference also included presentations from researchers who have not only studied those conditions but experienced them personally. This included prevention of common health problems related to high-altitude (Dr Hess, Switzerland), relationships between doping and high-altitude training (Dr Suchy, Czech Republic) as well as a historical/philosophical retrospective of climbing aids (Dr Kayser).

Education

One of the main goals of this conference was to bring together young and established researchers from all over the world, particularly from developing nations who do not get enough international exposure in medical research. Thus, two special educational sessions were carried out. The first was dedicated to methodology of research and papers, which would help young scientists create and publish their own work according to accepted international standards (by Dr Russi, Switzerland). The second included presentations on existing educational programmes in developing countries, as well as experience of improving the quality of diagnosis in low-income countries (by Dr Schoch, Switzerland). As noted above, special attention was given to original research studies by young scientists. Among these, the winner of the international Young Investigator Award named after Academician M. Mirrakhimov was selected and presented with a diploma (M. Furian, Switzerland).

Total Participants

- Number of faculty members (intl.): 27 (Kyrgyzstan, Switzerland, USA, UK, Germany, Canada, Netherlands, Spain, Czech Republic, Japan).
- Number of young researchers (total): 26.
- Number of participants from Kyrgyzstan (total): 37.

Conclusions and Outlook

Over four days, the Symposium brought together scientists of different interests tied to high-altitude medicine from a dozen countries across the globe. For Central Asia and for the field of high-altitude medicine, it became a unique event. Both the diversity of the participants, as well as the variety of topics were unprecedented: from pulmonary diseases and public health issues in highland and lowland, to specific physiological responses to hypoxia; from theoretical models and historical retrospectives, to the newest research, clinically relevant results and practically applicable advice for patients at altitude.

In addition, the forum facilitated communication between young and established researchers, whilst the separate poster session helped researchers receive direct feedback on ways of improving their research methodology and generated ideas for new research. Young and established scientists were able to freely participate in scientific discussions, informal dialogue and team building events that are crucial for improving intercultural communication, building lasting relationships and establishing long-term partnerships. This had an invaluable educational value for both researchers from developed and developing countries alike; long term, this will undoubtedly lead to more international cooperation and more quality medical research, particularly in areas that are severely lacking in resources, knowledge, and opportunities for young people.

We all are very grateful for the PVRI central office's sponsorship, which has provided a cornerstone for future medical cooperation, particularly in the challenging environment of the Central Asian region, and given us hope to see more unique research contributions from that region at future conferences.

Organising Committee of the Symposium

- Prof. Talant M. Sooronbaev, MD (Bishkek, Kyrgyzstan).
- Prof. Konrad E. Bloch, MD (Zurich, Switzerland).
- Prof. Max Gassmann, DVM (Zurich, Switzerland and Lima, Peru).

