mmsn Newsletter

Vol. 4 Issue 1 April 2007

CONTENT

Editorial .....

● Dr. Soni Srivastav

Early this year the members of the second executive body were chosen at the General Assembly of the Mountain Medicine Society of Nepal. The first executive body comprised of founder members who served their turn and are now mostly abroad, and all sent their good wishes as the baton was passed on.

At the General Assembly as we went over the achievements and activities of the past years, it seemed a pretty hefty list. Another prominent feature was the renewal of the organization, a mountain in it's own right in a bureaucracy like ours.

As we step into our fourth year, it's good to see talented youngsters taking interest. Our society is for those who want to explore the vast wealth of natural beauty in our country that people the world over come here for, braving unstable politics and diarrhea! It's for those who are intrigued by the ability of the human body to withstand extreme adverse conditions as man follows his dreams to scale the highest peaks in the world. It's for those who determinedly follow their inquisitiveness to new discoveries. It's for those who support not only the dashing climbers but also the humble porters who are the backbone of mountain climbing and high altitude tourism in Nepal.

In our quest to learn from the brightest minds in high altitude medicine and also expand our own minds into unchartered territory, may we go ever higher.

How Can Our Statures Touch the Skies?

President's Corner

● *Prof. Buddha Basnyat*

We never know how high we are till we are asked to rise. And then if we are true to plan, our statures touch the skies". These are inspiring lines by Emily Dickinson. And now the Mountain Medicine Society of Nepal (MMSN) is asking you to rise and find out your true worth and exploit your potential. Rise up and be counted. Our society is four years old, and many of you have already taken advantage of the usefulness of the society whether you are here in "hamro" Nepal, the US, England, Canada or anywhere in the world.

If you took part in some research in the Himalayas that we organized or helped you find a spot with foreign researchers, I am certain the memories of your mountain research are absolutely vivid. It is not only the science that went with the research, but the stunning setting that took your breath away. You were away from the smoke and grime of Kathmandu breathing fresh mountain air and experiencing the joys of high altitude research. Some of you I know have helped out by being expedition or trekking group doctors and had to listen to the complaints of many trekkers, but at the end you were able to gain important knowledge of high altitude medicine and help out your patients. Not to mention the thrill that accompanied the magnificence that surrounded you, whether it was the Khumbu, Annapurna, Manaslau, Dolpo, or Jumla. It was all worth it.

It was a great pleasure for me last fall to see many of you go to the Pheriche and Lobuje to carry out the research to test the efficacy of acetazolamide in the prevention of high altitude pulmonary edema. I think you took part in a great adventure. For many of you this was also an opportunity to see your own country. Bangkok, Honk Kong "bhane ko ta audai garcha". Many visitors invest lots of time money and effort to see our majestic country, and yet these mountains are right in our backyard. Did you not feel it was high time you saw these places?

Were you not intrigued by the hypothesis we were testing? That compared to a placebo, acetazolamide will significantly bring down the pulmonary artery pressure at high altitude? This next point is key: Regardless of the final outcome of the research (that is whether acetazolamide works or not for this purpose), it was great to know that you were following proper methodology to come to a conclusion. You were embarking on a true scientific adventure. And this is when serendipitous discoveries happen. (Don't rule this out, ha ha!!) You also saw how meticulous you had to be to carry out research, how the randomization process worked, how the double blinding was done. Imagine you were doing all this in the heart of the Himalayas even as you witnessed a breathtaking sunset or sunrise. You also experienced how to trouble shoot when the machine or your initial plan broke down in the field, not an easy task. You had to use your brains; there were no teachers' notes or Guytons textbook to bail you out. You know very well even if they were there, they would not have helped one bit as you were trying to prove your own hypothesis.

All this you were able to experience through the MMSN. Furthermore there were other fringe benefits. For example, you also saw how beneficial it was when you worked as a team player, something you may agree almost unheard of in our Nepali characteristic which is well reflected in our politics of the day.

Finally for the new members that want to be part of us, we hope in the future we can provide as much fun and excitement. As I keep saying this excitement may be infectious. And for a change we are not talking about typhoid or TB, the subject of another " dui sabda" in the years to come, ha ha!!! In the meantime see you on the trail in hamro Nepal.

THE EARLY PIONEERS

The early pioneers who ventured into thin air flew higher and higher, testing man's adaptability to a rapid ascent to altitude. Unlike mountaineering, where climbers mostly took time to acclimatize, the early balloonists experienced acute exposure to altitude, and some of these attempts proved fatal. Over the centuries, we have learned through trial and error, and even through the untimely deaths of those who ventured too high.

?ACUTE APPENDICITIS IN THE HIMALAYAS

• ***Dr. Anonymous***

In October 2006 a British Echo cardiographer, a senior house officer from Kathmandu and myself were in Lobuje (4900 meters), eight hours walk below the Everest Base Camp in the foothill of the mighty Himalayas. We were there in a Stanford University based research "High Altitude Pulmonary Edema prevention Trial 2006." One evening when it was snowing outside and the dining hall of the teahouse was full of trekkers on their way to or back from the Everest Base Camp (5350 meters) or Kalapathar (5545 meters), we were busy looking at and tabulating our research data. The owner of the teahouse approached us and informed that one of the girls working for the teahouse was complaining of severe abdominal pain for the last few hours. We hurried to her room and found a 15 year girl rolling from side to side in pain on her bed. When we finished taking her history and examined her we had the impression that this could be a case of Acute Appendicitis. Acute Appendicitis being one of the surgical emergencies, we were worried by the fact that the nearest town with the surgical facility was Kathmandu, a three-day walk down the hills and a 45-minute flight from Lobuje, the latter being almost impossible for a poor maid girl without an inkling of insurance.

We had been using an echocardiography machine for our research so an idea of getting the abdominal scan of the girl went through our mind. But for our Echo cardiographer, doing an abdominal scan was as challenging as it was to us. We made an announcement in the dining hall asking if there was anyone who could do it. To our surprise there were two British Radiologists trekking to the Everest Base Camp. They did the abdominal scan with a probe normally used for echocardiography and found no evidence for acute appendicitis or ruptured ectopic pregnancy or peritonitis. We decided to treat her symptomatically and put her on pain killers, Ranitidine and antibiotics. With the medication her pain subsided to a great extent and she slept the night.

Early the next morning, when we saw her cheerfully serving tea for the customers, we explained her possible immediate complications of an acute appendicitis, which was our provisional diagnosis. We agreed that it was her luck that she didn't have appendicitis that time. Otherwise what would have happened to that poor girl from the Himalayas who was deprived of basic health facilities?

ON EVEREST WITHOUT OXYGEN

The climb of Messner and Habeler in 1978 was a major event in the history of high altitude physiology and forever ended the debate as to whether an "oxygenless" ascent of the world's highest peak was possible. What made this climb so extraordinary is that, through a remarkable coincidence, the summit of Mount Everest is very near the limit of human tolerance to hypoxia. Were the summit only a few metres higher, basal oxygen requirements would exceed maximal oxygen uptake, and it would be impossible to reach without the aid of supplementary oxygen.

"Now, after the hours of torment ... I have nothing more to do than breathe, a great peace floods my whole being. I breathe like someone who has run the race of his life and knows that he may now rest for ever .... In my state of spiritual abstraction, I no longer belong to myself and to my eyesight. I am nothing more than a single, narrow, gasping lung, floating over the mists and the summits."

The first ascent of Everest in 1953 by Edmund Hillary and Tenzing Norgay proved that acclimatized humans could indeed stand upon the summit without collapsing. Twenty-five years later, in 1978 Peter Habeler and Reinhold Messner climbed Everest without supplementary oxygen for the first time, demonstrating a truly astonishing feat in terms of both human physiology and mental determination.

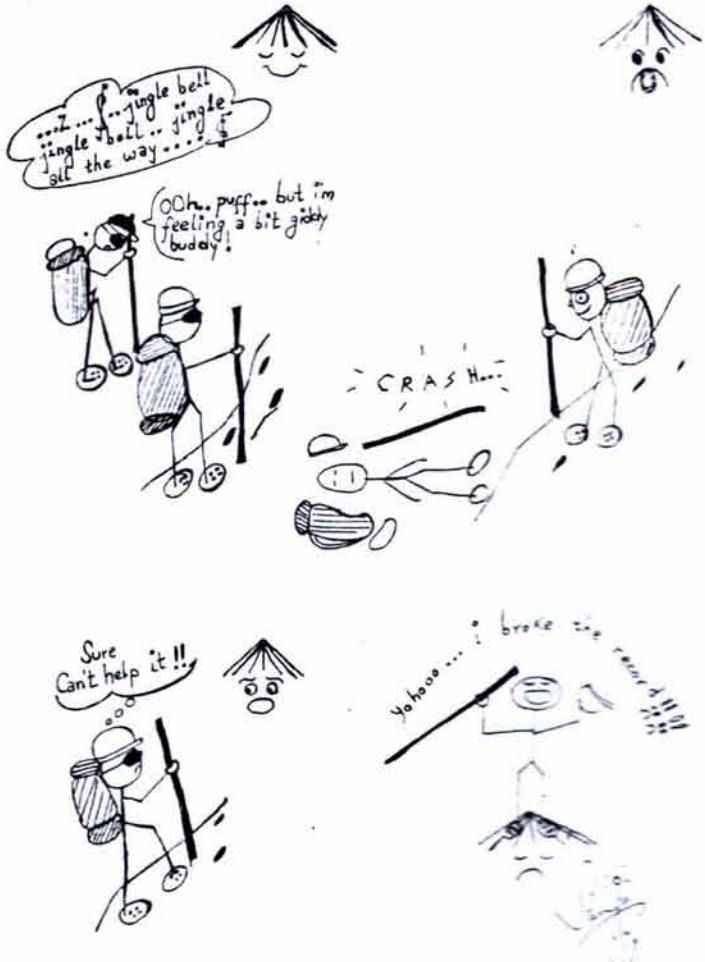
DEAD AND THE NOT SO DEAD...

...What can we do about it???

● *Dr Sanju Lama*

This is a thought that crossed my mind when i got to read about sick mountaineers in the Everest expeditions, and how they tackled the mighty peak, giving in to AMS, in one case, and dying due to lack of oxygen supply in the other.

There were two such that have come into public notice recently, one was Australian climber Mr. Lincoln Hall, 50, one of Australia's most experienced climbers who had succumbed to AMS with features of Acute Psychosis, and hence resisted attempts by the accompanying Sherpas to help him. They eventually left him, worried of the fact that they could run out of Oxygen; the other team members had apparently left him much earlier.



Down in the camp, on Friday, a statement was issued declaring the Australian DEAD, perhaps only an assumption!

However, an American climber Dan Mazur , it seems gave up his own bid for the summit, and decided to hunt for the body of the fellow Aussie climber.(if at all he were dead) and which he did find actually, half undressed and hatless, and with amputated frostbitten toes and fingers! And yes, very much ALIVE ! He was then reportedly carried on the back of a yak 20km to the base camp, at 5300 metres, much to the relief of the rescue operation consisting of a dozen Sherpas and a Russian doctor.

The other was British climber David Sharp, 34, who was dead on the way leading to the Everest summit, and it seems none of the teammates or the other teams who frequented past him on the trail, despite knowing the fact that there was a dead man lying there, could not bother to do something about reaching the body down to the base camp.

Friends, this is what I deducted after reading those articles, and towards the end they have mentioned about the ethics and practices of the so high priced and extra-popular Everest expeditions, which perhaps has no justifiable answer to matters when it comes to declaring an alive man dead , and not bothering to bring home the body of a dead mountaineer!

There could be a space for consideration as to the lack of oxygen, bad weather, and so forth understandably but I can't understand how can one be considered dead while there's an ongoing search by the experts. Or, how can one overlook a fellow human being dead in the mountains in foreign country, and still not bother to help carry the body down, and inform his family back home! Yes ,it must be hard up there, as opposed to what I

say sitting here in front of the computer on a perfect sunny day in Kathmandu; but isn't that all taken into consideration when one goes to scale the peaks right from day one? The adventure, the challenges, the urge to conquer... I guess are the very fabric that form the base of all such expeditions. So when one knows that hardship is bound to come, one must be prepared to fight them off, not just to save your own lives, but to save that of your fellow climbers too. It could happen to anyone!

I can't really figure out , where we, as doctors ,and members of the Mountain Medicine Society of Nepal stand? Our ethics don't allow us to let anyone die just like that, but the thought of these suffering climbers makes a shiver run down my spine, and feel disgusted about the irony that apart from being unable to save lives, we could even forget the basic human sense of duty to mankind atop the mighty Everest perhaps!

I hope these things are given due consideration, so that this is not repeated in future; that we could come up with proper solutions; that these people who pay so much for the expedition to come to our country, awed by the mystic mountains, do not land up paying their lives for it, never to be heard of again!

[Dr. Sanju Lama is currently doing a Thesis based Masters' program at the University of Calgary, which gives a Specialization in Mountain Medicine and High Altitude Physiology.]

THE EARLY PIONEERS

Ancient evidence of the human urge to venture into thin air exists; the Iceman, for example, was found in the Alps at 10,000 feet on the border of Austria and Italy, and appears to have died in a fierce storm some 5,000 years ago. We are not quite sure exactly what the Iceman was doing so high up in the mountains.

The earliest written accounts of mountain sickness date back nearly two millenia, the story of the human quest to go higher, and the gradual discovery of our physiological limitations in extreme altitudes.

O Manang!!

Dr. P. Ravi Shankar

East-west vale behind the Annapurnas
A Himalayan Shangri-La beckons

The great rock of Pisang guards the gate to the fabled land
Where every afternoon, roaring winds raise devils of sand

The Annapurnas, the Chulu series of peaks
The dark blue sky, conifers and lakes

Man's but an intruder in the pristine landscape
Brown, green, blue, white dominate Nature's kaleidoscope

Scattered villages dot the fabled land
Horsemen gallop following the lie of the land

Buddhism's a living presence
Prayer and piety, the land's essence

The airport at Hongde, a leap to the twentieth century
The monasteries and Gompas, a throwback to the fifteenth

Tourists throng the ancient land
A slice of Tibet in Nepal's at hand

Modern hotels skirt the ancient stone cobbled lanes
Western clothes, guitars sing a soulful strain

The burning hearth, the centre of family life
For some eking out an existence's a daily strife

Manangis circle the world
Drawn away by the lure of gold

Milarepa's a living presence
Videos and movies, a daily fix, obeisance

Trekkers trudge the land, Thorung pass and beyond
Others seek solace in Tilicho Tal, the absence of sound

Is the automobile, a blessing or a curse
Meditate in a land where peace comes dripping slow, peruse

The dying Sun paints the Himals variegated shades of red
The scent of pines, eggs you on, to lead and be led

Clouds blown hither and thither by the wind
The spinning prayer wheels cast you out of the earthly bind

Manang's a state of mind
A land where strife, chaos seems far far away

O Manang, O Manang
Thou art a jewel among lands'
A Himalayan diadem set in Nepal's crown

MY TRIP TO GOSAIKUNDA

------- *Suvash Shrestha* -------

It's about MMSN, HRA and the sacred lake Gosainkunda. This year, Drs. Kshitiz Alekh, Anupa Baral and Poonam Khadka, and myself, a medical student, along with HRA staff Govinda and Kiran dai took part at the 2063 annual health camp conducted at Janaipurnima.

I was both anxious and excited about the trip since it was my first high altitude venture, that too for such a mission! I wanted to travel light but the rucksack kind of swelled up. I was so relieved to see other members' huge bags!

I didn't know any of the team from before, but soon we were all joking, laughing and singing. Everyone seemed so funny and with Govinda dai - everytime popping up interesting topics - the journey could have been no better. Breathtakingly beautiful landscapes, unpredictable winding roads, refreshing snacks and non-stop music - what else could I wish for?

Our land cruiser wasn't able get past a recent landslide near Ramche, an annual event there each rainy season. After walking for two hours we boarded an already overcrowded bus loaded with pilgrims on the other side of the landslide. The remaining two hours of the journey to Dhunche was not a great experience to remember!

Excited, we started to climb early next morning. But that excitement didn't last long as our bodies began to ache. Even the cool refreshing air, beautiful green forests, soothing musical streams couldn't help. The slippery, narrow, uphill path and big back-aching loads were just too much more than we had expected. But there was no way back. Luckily we had Govinda dai – a veteran for whom it was his twelfth trip! He was motivational and provide constant encouragement: "*Aba ko bato sajilo cha, aba dherai hidnu pardaina*" Never true of course!

All the way we shared "Jaya Sambhoo!" and wide smiles with the pilgrims and took rests in the tent type temporary hotel made for a few days each year to cash Janaipurnima pilgrims!

Chandanbari was the first stop. Having hiked the whole day, we were tired and should have slept early but it was too cold to leave the fire in the dining room. We stayed up talking deep into the night.

Next day, a steep ascent through a pine forest brought us to Cholangpati where we tasted Chaunri milk. It was a first for me and I had gastrointestinal worries but they were unfounded.

Up we hiked enjoying one of the most beautiful landscapes in the world – the unobstructed majestic view of a long stretch of snow capped Himalayas. We stopped for the night at Lauribina and pleasantly passed time playing Antakshari when rain and hail confined us inside the hotel.

Much of the climbing had been done so next day we cruised along slowly. First came Bhairabkunda and then Gosaikunda. The famous Hindu pilgrimage was flocked with people from far and wide. We were all delighted to be at this holy place at the holy season.

There was no time to dilly dally and we soon got busy putting up camp. A shed, a table and few chairs were quickly transformed into our state of the art clinic which we shared with another medical group from the army. In fact, we were lucky to have a functioning electric bulb! The inner room became a sort of intensive care unit for serious patients and the porch of the house was the OPD.

Along with patient care, my job was also to collect data of children below 15 years for an ongoing research on "Acute mountain sickness among children below 15" conducted by MMSN every year at the time of Janaipurnima. So, I set out, armed with my questionnaire and pulse oximeter.

We saw about 400 patients, most with mild altitude sickness. There were also many cases of minor injuries, acid peptic disease, etc. It was a hectic day, we had not a moment's rest !

The serious cases were mostly elderly people. One old lady was brought on her son's back unconscious with a very low blood pressure and an SpO_2 <50. With HACE as the provisional diagnosis, prompt oxygen, IV fluids and steroids improved her condition and she was taken down.

The next day, Janaipurnima brought few patients as people prayed early in the morning and then quickly descended. So, we too took our turn at the rituals. It was not even twelve in the afternoon, when the place – which had been flooded with pilgrims just a few hours ago – looked deserted. So, we too packed up our little hospital and after a long last look at the holy place, started our journey home.

Now back home, one might think, "How boring that would be?" but, my friends, believe me, life was so simple, free and natural that I didn't miss these modern amenities - not even for a single moment. Instead, I felt completely refreshed and reenergized after the trip. I think that's why even lord Shiva chose to stay there. Nice choice, dude!

Jaya Shambhu!
Hara Hara Mahadev!
Hara Hara Mahadev!

HIGH ALTITUDE Pulmonary Oedema and Echocardiograms

Anna Griffiths

An echocardiogram is an ultrasound test commonly used for assessing the structure and function of the heart. Ultrasound waves are sent from and received back to a probe placed on the patient's chest. A 2-dimensional, moving image is then created. These images can show us all the heart chambers and valves, as well as some of the vessels into and out of the heart. As part of this study we can use Doppler echocardiography to assess blood flow direction and velocity.

I was fortunate enough to be involved in the High Altitude Prevention Trial 2006 along with several of your colleagues. My role in the trial was as an echocardiographer. The purpose of the trial was to ascertain whether Acetazolomide (Diamox) could help *prevent* high altitude pulmonary oedema. This was a double blinded study with participants being randomly assigned to either Acetazolomide or placebo. As you will know, Acetazolomide is commonly used both for the prevention of altitude sickness and for the treatment of altitude sickness and high altitude pulmonary oedema, but it is not known whether it prevents pulmonary oedema. Using echocardiography we can easily detect if there are raised pulmonary arterial pressures. Vasoconstriction within the lung vessels due to decreased oxygen uptake (due to decreased pressure at altitude) causes elevated pressure within these vessels and this can lead to pulmonary oedema.

We can calculate this pressure by presuming that the increased pressure in the lung vessels causes an increase in pressure in the right side of the heart i.e. pressure 'backs up' into the right side of the heart. By measuring the velocity of tricuspid regurgitation (a trace of tricuspid regurgitation is a normal finding) we can perform a calculation that can then give us the peak systolic pressure difference between right ventricle and right atrium. However, in order to derive the peak pulmonary artery systolic pressure (also referred to as right ventricular systolic pressure), we must add to this value the right atrial pressure. By assessing the inferior vena cava we can estimate the right atrial pressure.

The tricuspid regurgitation velocity is measured using Doppler echocardiography and, using the Bernoulli equation ($P=4V^2$ where P is the pressure difference and V is the velocity of the blood flow), we can convert the velocity to a pressure gradient. Most echocardiograph machines can perform this measurement using built in software.

A normal sized IVC, which can be seen to collapse when the patient sniffs, is considered to indicate a normal right atrial pressure of approximately 5-10mmHg. If the IVC is dilated and does not collapse, this would suggest raised right atrial pressures and the figure would be higher (up to approximately 20mmHg). This pressure is then added to the pressure difference between the right atrium and right ventricle in order to arrive at the absolute peak right ventricular systolic pressure, which in the absence of pulmonary valve stenosis is the same as the peak pulmonary artery pressure.

For the HAPE trial, we measured the right ventricular/right atrial systolic pressure difference and assessed the IVC (thus providing an estimation of right atrial pressure) and recorded both. These were then added together to give us pulmonary artery systolic pressure (or right ventricular systolic pressure). When the code is broken to see which participants were on placebo and which were on Acetazolomide, the measurements can be looked at to see if participants on Acetazolomide had lower pulmonary pressures than those on placebo.

I am currently working as an echocardiographer in Middlesbrough, in the north-east of England. The department I work in, the Cardiac Investigations Unit, provides a wide range of cardiac tests such as echocardiograms, ECG's, 24 hour ECG monitoring and analysis, exercise treadmill tests, pacemaker checks and many others. There is also a cardiac catheter lab attached. I am specifically trained in echocardiography; other colleagues have undergone a broad-based training and then specialised in echocardiography. Our department performs approximately 9,000 echocardiograms per year.

Initially I had a Bachelor of Science honours degree in Basic Medical Sciences with Physiology. After graduating and working in a local hospital for a few years I saw a job advertisement inviting people to apply to train in echocardiography in order to address a national shortage of echocardiographers. This initiative was funded by the British Heart Foundation, the leading UK heart disease charity. After18 months I obtained my British Society of Echocardiography accreditation in adult echocardiography and was successful in gaining a permanent post within the department.

I would like to take this opportunity to thank all those of you I worked with for your kindness, hospitality and friendship.

.....walking with mmsn

Dr. Matiram Pun

I'm not writing this stuff as a newly elected secretary of MMSN. This is just a chronology of some of the things regarding MMSN and its dynamism. It was my second year at IOM when MMSN (*masan*) established. I was at Swopnil's when Dr Subedi turned up to get the Constitution typed. I was eating roasted maize which I offered to Prajan dai and talked briefly (as I claim myself a good junior to all of my seniors!!!). Dr Devish, Dr Prajan and others used to come to the Basic Science Building in the early morning to meet Prof Dr Buddha Basnyat and I guess it was all about MMSN. Then a few months later in October 2003 MMSN was launched in the auditorium of BP Koirala Lions Ophthalmic Study Center, IOM with heavy lunch packets and impressive presentations.

Few months later another presentation was held at TUTH Seminar Hall by a Canadian Doctor Mark Paulin about hypoxia and stuff. There it was called for new MMSN members but nobody came forward, as I remember. In the summer of that year, I trekked to Gosaikund along with my classmates. There I had the worst headache at 3900m height: at Lauribina. It started when I climbed above 3700m: Cholangpati. There I remembered about MMSN and Altitude Sickness along with Prof's classes. In the long break after the Basic Science Exams as my weird hobby and interest, I walked along the dusty and smoky environments of Lalitpur and Bhaktapur Brick Kilns, took participations in different workshops, seminars and Traininings. Those were my hey-days and happy go lucky type of activities. MMSN was one of the many things I started then. Since then it has been part and parcel of my activities and I have learned so much that I will have to write another article for that!

MMSN is Born

As I heard from Dr Pritam Neupane and others, the concept of MMSN was born in the few days prior to the trip of Goshaikund health camp. Dr Pritam and then third year medical student Prajan Subedi and others took constitutions of some other organizations to study and formulate the constitution of MMSN in the trip!

After returning, the concept materialized into organization. The first executive body had the following members:

President	Prof. Dr. Buddha Basnyat
Vice President	Dr. Pritam Neupane
Secretary	Dr. Prajan Subedi
Joint Secretary	Mr. Devish Pyakurel
Treasurer	Dr. Sanjay Yadav
Members	Dr. Puncho Gurung
	Dr. Santosh Pradhan
	Dr. Barun Kumar Lal
	Dr. Bhabishwor Tiwari
	Dr. Sajeev Upreti
	Dr. Prajwol Raj Pant

Transition Period

The transition period when the 20th Batch (when our Secretary Prajan Subedi and Joint Secretary Devish Pyakurel) as well as other active members had junior internship and final exams. Many academic activities did occur during the period like South Asian Conference and Website design. During this transition period we formed a working committee keeping the first executive body intact. The committee formed then and put onto our website had Drs Ramesh Subedi as Secretary and Promish Shrestha as Treasurer with the following members:

Dr. Anil Pandit	Dr. Bhabishor Tiwari
Dr. Ashish Maskey	Mr. Prajwal Raj Pant
Dr. Deependra Sharma	Dr. Matiram Pun

Core Concept Group

In the mean time when the executive body members were in different parts of the world and outside the valley even if present in Nepal, we brought the concept of "core group" which would work as an executive body. Obviously, the team consisted of regular members to be present in MMSN Journal Club and other activities of MMSN. I did work efficiently and the concept was great!

Second Executive Body Formation

First executive members did wonderful things for MMSN and for their career too in Nepal and abroad

both. The society gained momentum and despite the busy schedule and absence of most of the executive body members MMSN did well because of few present executive body members e.g. Drs Prajan Subedi, Devish Pyakurel and other genuinely interested members like Dr. Soni Srivastav and others. Much kudos goes to Dr Prajan Subedi for renewing our Organization. We all know how much difficulty he has gone through. Most of the executive members abroad, no office, no account. four years since it was formed but no new body or GA (General Assembly)! And documenting all the activities as well as bearing the bureaucracy of Nepal is an unimaginable burden! We can only imagine the total fuss during the process but he did it and we have to continue the legacy.

Then Dr Prajan Subedi decided to hand the responsibility over to a new executive body for which the GA was organized and the floor made open for a new (second executive body) to be elected. According to which the following executive members have taken the responsibility as second executive body of MMSN:

President	Prof. Dr. Buddha Basnyat
Vice President	Dr. Ksitiz Alekh
Secretary	Dr. Matiram Pun
Joint Secretary	Mr. Suvash Shrestha
Treasurer	Dr. Suraj Parajuli
Members	Dr. Kaushal Raj Pandey
	Dr. Laxmi Vilas Ghimire
	Mr. Saroj Neupane
	Ms. Sarensa Palikhey
	Mr. Siddhartha Yadav
	Ms. Rashmi Banjade

Subcommittees

a) Liaison:
Dr Ksitiz Alekh
Dr Matiram Pun

b) Journal Club:
Dr Laxmi Vilas Ghimire
Mr Suvash Shrestha
Mr Siddhartha Yadav

c) Publication:
Mr Siddartha Yadav
Ms Rashmi Banjade
Dr Santosh Kumar Dhungana
Dr Smriti Manandhar
Ms Sarensa Palikhey

d) Website/E-Subcommittee:
Mr Matiram Pun
Dr Angel Magar
Mr Raaj Krishna Shrestha
Dr Subhash Khanal
Mr Jhapindra Pokhrel

e) Academic and Research:
Prof Dr Buddha Basnyat
Dr Matiram Pun
Dr Laxmi Vilas Ghimire
Dr Kaushal Raj Pandey
Dr Ksitiz Alekh

This is the update of the MMSN Journey. Dr Prajan Subedi thought he was going to take a sigh of relief and take rest from MMSN but the table has been turned the other way round for him. For me and other executive body members it's a nice time to learn organizational stuff and work from him. People come and go but the organization stays and so is the case for MMSN. We will have to move on.

Long live MMSN!

Can We Climb Higher?

Is Everest as high as man can go?

It is thought my many that the summit of Mount Everest is fortuitously just as high as an acclimatized human being can go and survive without breathing supplemental oxygen; if Everest were a 1000 feet higher, the physiologic challenge would be beyond humans.

Near the summit of Everest, because the partial pressure of oxygen in the blood is so low, one of the bottlenecks to moving oxygen from air to organs seems to be a limitation of diffusion from the lung alveoli into pulmonary capillaries and perhaps also from tissue capillaries to the mitochondria of cells.

When one works harder at extremely high altitude, blood passes more rapidly through lung capillaries; the time available for oxygen to move from lung into the blood is shortened. So, at the summit of Everest, when a climber exerts a little too much without supplemental oxygen, the blood oxygen concentration falls, vision may dim, and efforts slow, sort of like having a governor on a car's motor to keep it from going too fast.

Another hint that Everest is close to the limit for us humans is that studies of climbers returning from high altitudes indicate that some have evidence of mild, transient brain injury.

Those individuals have problems remembering and recalling new information, or show confused thinking, or have trouble performing rapid fine muscle tasks such as finger-tapping.

These changes represent one more possible hazard of climbing Mount Everest, along with all the more obvious risks involved in mountain climbing at the upper end of the earth.

Children on The Road Less Travelled

Dr. Sanjay Yadav

A couple wishes to take their two children aged 4 and 6 years on a four week trekking holiday. They will be sleeping at a maximum of 3600 meter ascending over a 4000 m pass, they want to know the logistics, recognizing and treating AMS in these children and specific addition to their medical first aid kit.

Advice to parents:

The 3'Ps' (practicalities, preparation and prevention) would be with regards to where they are taking their 4 and 6 year old children for the trip. Discuss the likelihood of altitude illness (4000 m), exposure to cold, dehydration or solar exposure depending on the season and part of world. The logistics would involve the 3'Ps' for a four week long trip including consideration for the highest sleeping altitude of 3600m. I would ask them to ensure an escape route from high altitude if necessary; provision of communication to facilitate evacuation where necessary and to be prepared for disruption of routine.

Practicalities

Both children at 4 and 6 are expected to report symptoms verbally but extra caution must be taken that they may be poor at communicating symptoms in this age range. Ascent higher than 2500 meters including prolonged stay above 3000m more than a day needs a graded ascent, built in rest days and emergency planning.[3] Consider how many days the young children will be exposed above 2500 m. The parents; accompanying two children, should be more careful in choosing the logistics and be prepared if one gets ill there is more to take care of other one. As the children would be exposed to moderate high altitude, knowing their underlying medical condition would be very important especially the predisposing conditions to altitude illness.

- Careful acclimatization and brief exposure where possible above 3000 mtrs should be advised
- Cold and heat: Adequate clothing is necessary to prevent hypothermia and frostbite
- Boredom: Children have a short attention span and a stimulating itinerary should be chosen
- Physical activity: Children should only walk as long as they want to
- Hygiene: Toileting, soiling, diaper disposal, adequate clothes to change for a period of 4 weeks. Scrupulous attention should be paid to handwashing and toys that fall to the floor.
- Food: It is important to ensure adequate food and liquid intake, purified water for drinking
- Intercurrent illness to encounter, UV radiation exposure
- Solar radiation: Children are more likely to burn than adults and appropriate sun block creams, hats, long sleeves and goggles will be required

Preparation

- Take medical history - Consider risk factors for altitude illness in children: Review/investigate where likely for wheezing, restrictive lung disease, cardiac shunting conditions, perinatal cardiopulmonary problems, red cell disorders. Physical examination for growth indicators.
- Check immunization status, gastrointestinal problems and ENT infections, allergies and any regular medication the children are on
- Risk assessment with trip specification is of great value:

Calculate the risk and time scale for ascending the 4000mtrs pass and reaching the sleeping altitude lower than 3600 meters taking both the children. Consider 4 and 6 year old school aged children behaviors, the altitude and remoteness of the location and the country epidemiology of infectious disease, climate and sanitary conditions. A leisurely itinerary when traveling with children to high altitude is of practical importance and needs to be emphasized. [4]

- Trip planning with regards to children gear, pacing with child on walks, acclimatization to altitude should be advised if parents are not well prepared.
- Children in flight should be considered as well if the trip is taking place which involves long flights or needs evacuation from the wilderness. Consider children having motion sickness.

Prevention:

- Rest on arrival is highly recommended
- Advice on graded ascent
- Drug prophylaxis; where recommended
- Children are more prone to gastrointestinal disorders and supplies to make a safe oral rehydration solution should be a part of every medical kit. Include antibiotics : Azithromycin, Nalidixic acid
- Children should be appropriately immunized depending on the location of trip
- Pre-conditioning with physical capability of the children and food they are likely to eat for the trip

Recognizing and treating Acute Mountain Sickness (AMS)

Any child who becomes unwell at altitude should be assumed to be having altitude illness unless a clear alternative diagnosis is obvious.[2] AMS symptoms are non specific in children and might present subtly. It would best be recognized and rated how well the children have eaten, how well they slept and how playful the children have been. (Children Lake Louis score in younger kids). Advise parents to look for symptoms – Headache, nausea, dizziness, fatigue, insomnia and three signs –disorientation, ataxia and swelling. Advise them if they have more than three symptoms/signs they should think of altitude related illnesses. Loss of appetite, vomiting and diarrhea are signs to recognize AMS.

Advise the parents about AMS treatment which may involve

- Rest at the altitude where symptoms started.
- Immediate decent on exacerbation: Carry child where practical to avoid extra exertion [3]
- Oxygen
- Acetazolamide at pediatric dose (2.5 mg /kg/dose PO 8 to 12 hourly (max 250mg)[3]
- Analgesics: Paracetamol, Ibuprofen. **Aspirin** is not recommended

AMS and the onset of high altitude pulmonary or cerebral edema can be easily overlooked in young children, the diagnosis should always be assumed when a child becomes unwell above 2500 m and descent should start immediately. Rapid descent will usually relieve the symptoms of acute mountain sickness, may be lifesaving when HAPE/HACE are present, and is the only definitive treatment for all forms of altitude illness. There is no place for a "wait and see" approach when children have AMS.[1]

Addition to standard medical kit[4]

Choice depends on trip location, part of world, accessibility

- Oral rehydration solution
- Child-safe hand wipes, diaper rash ointment
- Water- and insect-proof ground sheet for play outside
- Antihistamine, Decongestant, alone or in combination with antihistamine
- Motion sickness medication, Cough suppressant/ expectorant, Antifungal/antibacterial creams
- Insect repellent ,Sunscreen ,Aloe gel for sunburns, Digital thermometer
- Basic first-aid items (adhesive bandages, gauze, ace wrap, antiseptic, tweezers, scissors, cotton-tipped applicators),Antibacterial hand wipes ,Moleskin for blisters.

References

1. BMJ 1998: 316:874-875, Editorials. Children in the mountains Pollard, Murdoch and Bartsch
2. BMJ 2003: 326:915-919 (26 April). Clinical review. Altitude illness. P W Barry, A J Pollard
3. Children at High Altitude: An International Consensus Statement by ISMM, March 12, 2001
4. BMJ 1998: 317:540 (22 August) Letters. Children in the mountains. Advice given was too conservative, Buddha Basnyat, Namka Sherpa. G Basyal. P Adhikari.

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EVEREST RISES

Mount Everest, standing over 29,000 feet above the surface of the sea, is the highest point on earth on which a human can walk. As such, the challenge of reaching this so-called "Third Pole" was a dream of explorers and mountaineers from the moment it was first identified as the highest point in the world.

The highest mountain is slowly uplifted to yet greater heights by the tectonic plate migrating northward below. It is estimated that this part of the Himalaya is being pushed up about 4 millimeters a year. In a mere 100,000 years, assuming no wear-and-tear from the tread of human feet and other causes, Everest will be a 1000 feet higher than it is now. Will it become physiologically out of reach except by using supplemental oxygen? Perhaps. But who knows what sort of humanoids will be seeking the highest point on earth by then?

mmsn ACTIVITIES

HAPE STUDY TRIAL

The directors of the study are MMSN President Prof Buddhya Basnyat and Dr. Jenny Hargrove from Stanford University, USA. Members of MMSN Drs. Soni Srivastav, Komal Kaul, Kshitiz Alekh, Ramhari Ghimire, Laxmi Vilas, Kaushal Raj Pandey, Ashmita Poudyal took part in a research study done on the prevention of HAPE in Oct-Nov 2006. Echocardiographers Anna Griffiths and Dave and study administrators Rose Basnyat, Cathy, and Tom were part of the team. With Nepali, Indian, American, Canadian, and British representation, it was truly an international team! The research was based in the Khumbu valley at Pheriche and Lobuje.

JOURNAL CLUBS

As our regular academic activity, we organize a monthly journal club. It keeps us updated to the news and events in the world of high altitude medicine. The following members presented various papers:

1. Dr. Laxmi Vilas Ghimire, at IOM
2. Dr. Asmita Poudyal, at IOM
3. Dr. Komal Kaul, at IOM
4. Suvash Shrestha, at IOM

GOSAIKUNDA TRIP

One of the yearly featured social services, research activity and an organizational involvement of MMSN is Goshaikund Health at Janai purnima every year. In the year of 2063 BS Drs. Poonam Khadka, Anupa Baral, Ksitiz Alekh and a medical student Mr. Suvash Shrestha trekked to Gosaikunda and worked at the HRA health camp held at the time of Janai Purnima. More than 300 patients were seen along with HRA staff Mr. Govinda Basyal, Khagendra and Kiran Rai. The team also collected data for the prevalence and incidence AMS among the children. More than 55 children have been enrolled in the study this year.

EVEREST MARATHON

The revered competition Everest Marathon is organized in an yearly manner in the Nepal Himalayas. Dr. Kshitiz Alekh had attended and worked as an Altitude doctor in the team.

PORTER EDUCATION SEMINAR

The Himalayan Rescue Association Nepal regularly organizes training and educational programmes about Altitude Sickness and Health and Hygiene for porters. The following doctors were involved from MMSN:

1. At Kathmandu- Drs. Soni Srivastav and Laxmi Vilas Ghimire in April 2006
2. At Bhaktapur- Dr Ksitiz Alekh in June 2006
3. At Lukla- Drs. Promish Shreshtha and Laxmi Vilas Ghimire in December 2006
4. At Dhunchhe- Drs. Soni Srivastav and Santosh Dhungana in March 2007

EXPEDITION DOCTOR

MMSN members work as expedition doctors with trekking groups organized by trekking agencies. Dr. Ram Hari Ghimire joined a trekking team this year.

INTERNATIONAL HYPOXIA SYMPOSIUM - 2007

MMSN member Dr. Sanju Lama attended the 15th International Hypoxia Symposium 2007 at Lake Louise. this happens every 2 years at the same beautiful Ski town; and presented two posters viz. "The Role of Altitude level in Cerebral Autoregulation in man resident at High Altitude" by Jansen et al and "Changes in Ku 70 expression following cerebral Hypoxia / Ischemia in neonatal rats" by Meng et al.

The Gamow Bag

The Gamow bag, as named after Dr. Igor Gamow, is often a feature of aid stations high in the mountains. It is an inflatable pressure bag big enough to fit a person inside. It simulates the conditions at a lower altitude in order to help alleviate the symptoms of AMS, HACE and HAPE. Essentially, it is a cylindrical inflatable portable hyperbaric chamber with an attached foot pump to pressurise it. It can simulate a descent of over 1500m, depending on the starting altitude.

Strangely enough the bag was never intended to be used for mountain rescue. The bag was developed after the idea in the 1980's that athletes should 'train low, sleep high' in order to produce more red blood cells to transport more oxygen to the muscles, which in theory makes an athlete faster and stronger.

Gamow invented 'The Bubble,' a pressurised chamber where athletes living at high altitude could go to train at the oxygen-enriched sea level of their competitors. But despite much coverage and its brilliant reviews The Bubble never took off. This was primarily due to the bulky equipment and the problem of overheating, but more importantly, there was no market for such an invention - few athletes tend to live at high altitude.

But Gamow refused to give up, and, fuelled by his failure he marketed a human-sized 'bag chamber' to a new consumer - climbers. The climbing community seized it as the answer to all their problems. Without altitude sickness then they could climb higher, and faster.