The Newsletter & e-journal Kairaly Neurosciences Society NSI Kerala Chapter

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HEADLINES

- The Kairaly Neurosciences Society Annual meeting 2020 is being held at Perinthalmanna on February 22nd & 23rd **"EsSence"**
- Dr. P. Sreekumar received the life time achievement award from Neurological Society of India for the year 2019
- Dr. Mohanlal D. received the first life time achievement award of Kairaly Neurosciences Society (NSI Kerala Chapter) in the year 2018
- Annual Meeting of Kairaly Neurosciences Society 2019 was conducted at Kochi **"CALLOSUM 2019"**
- Mid– term Meeting of Kairaly Neurosciences Society 2019 was held at Kannur
- KNS members expressed heartfelt condolences on the sad demise of Dr. George Kovoor

PRESIDENT`S MESSAGE

Dear members of the Kairali Neurosciences Society,

It gives me great pleasure to write the forward for the first edition of the news letter published by our society. This has been a 'dream come true' for the editorial team especially Dr Sree Hari who has taken great efforts for the past one year to bring this out. I take this opportunity to thank all the contributors for this edition. It is my humble request to keep the subsequent editions live by enthusiastic contributions from the members. We propose to add separate sections based on the contributions.

A combined scientific news letter incorporating the Neurologists and Neurosurgeons of Kerala is highly essential for the following reasons.

1) It gives an opportunity to communicate and publish the scientific articles and hence improve the awareness of the neuroscentific material pertaining to Kerala.

2) It can keep us informed of the centres with specialised services available here instead of referring them to outside states.

As the specialities are advancing in leaps and bounds this is indeed the need of the hour. Invited articles from Neuroradiologists and Neuropathologists can add to the quality. This target is being achieved to some extent through CME programmes. However a permanent documentation of articles in write-ups through news letters is definitely superior as the retention capacity of the brain for lectures is limited.

The current edition includes the biographies of the great founder members of the society , a few case reports and about history of Neurosciences in Kerala.

As the term " Bodhi" suggests ,let it bring wisdom and enlightenment to its readers . I wish that with combined efforts of its members and guidance from senior teachers, we can take "Bodhi" to greater heights

Prof AS Girija
President, Kairali Neurosciences Society

Secretary's Message

Kairaly Neurosciences Society – NSI Kerala chapter as well known stands for Neurophysicians, Neurosurgeons and related sciences in collaborating co-existence. The mutual faith and support among the members has been the key factor in the successful journey of group. There has been a constant urge in the outlook of the society which has come true with release of the NEWS LETTER and e- journal "BODHI". The name itself implies the conscious positive creative vibes of the brain.

Just a newsletter was not our lookout as it would not help readers who likes to participate and contribute in the content. Hence adding scientific content involving both senior most and junior most members of the forum would help the process of 'learning in continuum' which is one of the aims of the society. I personally request all of the members and post graduates to actively send their write ups and vision which could be easily uploaded through our website. This will also encourage the writing skills of the juniors and post graduates. I thank all the Editorial Board members who toiled hard in the even during their busy practice for bringing up this first edition of BODHI.

I wish all the members and readers for a greater success

Dr.Raj S.Chandran
Secretary ,Kairaly Neurosciences Society

Minutes of Annual NSI Kerala Governing Body Meeting at Kochi 02/02/2019 - Dr.Raj S. Chandran

President Dr Unnikrishnan chaired the meeting.Secretary Dr Raj S Chandran presented the report of the previous meeting of NSI Kerala Chapter held at Kottayam and the minutes of previous governing body meeting. After discussions, the minutes was passed.

Treasurer Dr Tinu Ravi presented the accounts of the society, gave the details of fixed deposits and income from memberships and additional expenses for the upgradation of the website and was pleased about the current financial status.

The status of the corpus for the three orations was discussed and it was decided to continue the same as in previous years

Dr Sreekumar proposed the name of Dr Mohanlal as the new patron of the society and was accepted by the members

Secretary proposed to increase the membership fee and to introduce an annual fee; it was turned down by the general body

Election of New office bearers was conducted by Dr Balakrishnan who was elected as the returning officer by the GB

- Dr Girija A S , the existing vice president to take over as the new president.
- Dr Gnanadas elected as the vice president proposed by Dr Mohan lal
- Dr Raj S Chandran elected again as the secretary proposed by Dr Raymond Morris
- Dr.Tinu Ravi Abraham to continue as the treasurer proposed by Dr.Anil Peethambaran
- Dr Balakrishnan, Dr Reghu and Dr Jyohish to continue as executive committee members , which also includes the immediate past president, treasurer

<u>2019 academic meetings</u>

Mid term meeting at Kannoor accepted by Dr Suhas

Annual Meeting at Perinthalmanna accepted by Dr Gnanadas

It was decided to stick to the conference schedule for both Midterm and Annual meetings 6th octber 2019 and 8th, 9th of February 2020

The general body discussed the feasibility of starting a news letter under KNS, secretary confirmed that it is already in progress, with Dr Sreehari the webmaster of KNS and Dr Raj, the secretary KNS in charge. He also assured that the details of the members of the committee for the same will be announced soon.

Meeting came to an end at 1.30 PM.

Evolution of Neurosciences in India- A brief Overview

Dr. K Rajasekharan Nair M.D. (Med), FRCP (G), DM (Neuro)
Formerly, Professor and HOD Of Neurology – Govt : Medical College Thiruvananthapuram
President The Neurological Society Of India, Indian Academy Of Neurology and Indian Epilepsy Association

When Dr. Jacob Chandy (JC- 1910- 2007) came to Christian Medical College, Vellore to organize a Neurosciences Department in January 1949, after his greatly extended neurosurgical training in University of Pennsylvania, and Montreal Neurological Institute (MNI), he never thought that it would become an epoch-making event, later to be hailed as the beginning of neurosciences in India. One year and nine months later, Dr. B Ramamurthy (BRM- 1922-2003) came back from his neurosurgical training at UK and MNI and joined the Madras Government service on the Vijayadasami day on 24 Oct 1950 to start a Neurosurgery unit in Madras Medical College. Fortunately a 45-year-old Amritsar physician with MRCP (with some training in Neurology), Dr. Baldev Singh (BS- 1904 - 1998) left his flourishing general medical practice in his home town and joined Dr. Jacob Chandy in CMC Vellore in 1951. Dr. Chandy sent him to Chicago to get trained in EEG under Dr. Gibbs in Neuropsychiatric Clinic in Chicago and brought him back to Vellore.

JC, BRM and BS gained national acclaim (all of them were awarded Padmabhushan) and were considered as the founding fathers of Neurosciences in India. But there was an unsung hero in that group. Dr. S T Narasimhan, (STN-1913- 1959) was a medical diplomate in Madras who had gone to USA to get some neurosurgical and EEG training in 1945. He returned with a 2 channel EEG machine and set up a private neurological and EEG practice in Madras sometime in 1948, almost a year before JC came to Vellore. The credit of starting Neurosurgery in India should really go to him. He was an industrious person who initially helped BRM with his Madras General Hospital ward rounds, neurosurgical operations, and his EEG studies. Since he did not have any official job or salary from Madras Government, BRM arranged to reimburse him from Madras Medical College Rs 30 for every EEG done there. He underwent a short term MBBS Course as suggested by BRM and obtained his medical degree and was appointed as Professor of EEG in Madras Medical College in 1959. As luck would have it he died in the same year.

I may mention in passing that there were other daring surgeons in India, even prior to JC and BRM, who tried neurosurgery successfully out of sheer necessity to save the lives of their patients. Special mention may be made to Dr T H Somervell of Neyyoor, Dr. Chintan Nambiyar and Dr. Anirudha Varma of Madras Medical College for their pioneering efforts.

It is now rather difficult to believe that these just four people, JC, BRM, BS and STN sitting in Madras started a national society, for all neuroscientists in India 1951 and called it Neurological Society of India (NSI). Interestingly they were the only four people who had formal training in neurosciences in the whole of India. The fifth man who joined a year later was Dr. T. K Ghosh, (1912-1996) a neurologist from Calcutta.

By then JC who was a 'go getter' in all the spheres of his work, gradually became the most sought after neurosurgeon in the whole of India and earned a nickname 'ആയിരം തലൈ വാങ്കിയ അപൂർവ്വ മനിതൻ' a parody of then -famous Tamil film ആയിരം തലൈ വാങ്കിയ അപൂർവ്വ ചിന്താമണി'. BRM followed suit and became equally famous and sought after person. He too got a good nickname as Burrhole Ramamurthy. He was more articulate, polished and academic than his senior colleague JC

Founders of NSI- Dr. Jacob Chandy, Dr. B Ramamurthy, Dr. Baldev Singh, Dr. S.T.Narasimhan

The credit of starting formal postgraduate training in neurosurgery should go to both JC and BRM equally. Many surgeons had taken short term neurosurgery training under them. But they were keen to start formal post-postgraduate degree courses in Neurosciences-the first of its kind of super speciality degree courses anywhere in the World. JC started it initially at Vellore (it was called MS Neurosurgery initially, later changed to M.Ch). Perhaps the present day neuroscientists could not imagine the vitriolic opposition from the international neuroscientific bodies to the M.Ch and D.M Neurology courses started in India then.

The first person who took his MS Neurosurgery was Dr. K V Mathai (1926 – 2017) from CMC Vellore in 1961. The first two successful candidates for DM Neurology were Dr. Krishnamoorthi Srinivas (1933- 2017) and Dr. Mitra from University of Madras. By mid to late 1960s both M.Ch Neurosurgery and DM Neurology courses were started in selected centres in New Delhi AIIMS, Bombay and Calcutta. The selection to these courses was then extremely strict with the annual intake of one candidate per center. This state of affairs continued for quite some time and the candidates so selected were groomed to be the future teachers for different parts of India. It was in this milieu I joined in AIIMS, New Delhi in 1971 after my post-graduation in Trivandrum Medical College. I thank the foresightedness of one of my mentors Prof K N Pai (1916- 1993) who asked me to take up neurology as a teaching career immediately after my MD.

Even till the early 1970s there were only a few places in India like Vellore, Chennai, New Delhi, Mumbai and Chandigarh where neurological consultations and treatment were available. It was a sort of surprise for anyone then that a private Missionary Hospital like CMC Vellore could become such an important neurosurgical centre. The people trained by JC were equally good like Dr. KV Mathai, Dr. Jacob Abraham, Dr. Sambasivan and others. They followed the footsteps of JC in daring to do all sorts of even terribly difficult surgeries. As JC's Unit functioned as a composite center for all neurosciences together, Neurology per se did not come up very much there till Dr. Taori took up the reins of the Department.

But the position of neurology in Chennai, New Delhi and Mumbai was different. The eminence of BS who took over the Dept of Neurology at AIIMS was sufficient to keep the balance of power between Neurology and Neurosurgery in AIIMS. He was more of a neurophysiological researcher along with his great colleagues, Dr. Chinna, Dr. Dua and Dr. B. K Anand. Perhaps no one would remember now the enormous contributions of this group in hypothalamic functions, neurophysiology of Yoga etc. The AIIMS Dept of Neurosurgery had Dr. P N Tandon, Dr. AK Banerji and Dr. Bram Prakash leading neurosurgical care and research. When BS moved as Emeritus Professor of Neurophysiology. the Department of Neurology was taken over by Dr. Sumedha N Pathak and Vimla Virmani. By then there were a few in other places of New Delhi where both Neurologists (Dr. K. Jananki, Dr. Pant and others) and neurosurgeons (Dr. L.R. Pathak, Dr. Arjun Sehgal and others) were doing excellent work in their respective fields.

Drs. Sumedha Pathak, Vimla Virmani, Bram Prakash, S. Janaki

I should mention especially about the Institute of Neurology, the first ever such Institute in Asia. BRM was simply the very best neurosurgeon, orator, teacher and administrator in that place. I always quote Longfellow (Henry Wadsworth Longfellow- American poet. 1807-1882) when I think of BRM and JC *'The heights by great men reached and kept were not attained by sudden flight, but they, while their companions slept, were toiling upward in the night'.* The difficulties they faced to bring up their departments are just unthinkable now.

I had the luck to be an exchange student in the Institute of Neurology in is heydays with BRM as the chief. It may sound incredulous if I mention that the team BRM, Dr. Balasubramonium (1929- 2004), Dr. S Kalyanaraman, Dr. TS Kanaka (1932- 2018- one of the first woman neurosurgeons in the World) made Institute of Neurology Chennai as one of the most respected centers for stereo tactic surgery internationally. The neurology team with people like Dr. K Jagannathan (1928- 2012), Dr. G. Arjundas, Dr. C U Velmurugendran, Dr. Krishnamoorthi Srinivas (1933-2017) and others was equally balanced with the corresponding neurosurgery team of BRM et al. Frequent visitors to BRM's institute included Dr. Lawrence Walsh of Atkinson Morley Hospital London, Dr. Georg Schaltenbrand of *Universität Würzburg*, Germany and many others who were stalwarts to Stereotactic Surgery in those days. Dr. K Jagannathan and Dr. Arjundas also joined in their team doing Electrocorticograms while such surgeries were done, in addition to their routine neurology work. There was another person also in that department, Dr. K S Mani (1928-2001) who left Chennai and joined Dr. R M Varma (1921- 2015) when he who took over the old Mental Hospital in Bangalore and changed it into a national centre of Neurosciences, NIMHANS (1974). Perhaps I should mention here that neuroradiology was also first started in Chennai and that too by a Malayalee, Dr. K Mahadevan Pillai (1909- 1978).

Drs. K Jagannathan, Krishnamoorthi Srinivas, V Balasubramoniam, TS Kanaka

In those days in most of the places Neurosurgery had certainly an upper hand over Neurology but in Mumbai things were bit different with Dr. Eddie Barucha, Dr. NH Wadia heading their teams. Drs. Ram Guinde and Dr. Gajendra Singh were their corresponding surgeons. The neurological research they had undertaken got international acclaim. Dr. Wadia's work on SMON (Subacute Myelo Optico Neuropathy), Hereditary cerebellar ataxia (Wadia's Syndrome), Manganese poisoning etc gained vast acceptance internationally. For a long time Dr. Wadia was the Indian face of Neurology in international arenas.

But the person who started Neurology in Bombay was Dr. Menino de Souza (1904-1996) who is now totally forgotten. He was the fourth President of the Neurological Society of India. I tried to get any information about him in late 1980s and early 1990s from his students who by then became stalwarts on their own merit. All of them told me that he was dead long ago and no data was available about him. When I almost completed my book 'Evolution of Neurosciences in India' Dr. S M Kathrak got the necessary information about him rather unexpectedly and passed it over to me. It was a sheer shock to me to know that he was very much alive and active in Bombay itself till 1996 when all his ex-students said he passed away long ago!

Drs. Menino deSouza, NH Wadia, Anil Desai and Ram Guinde

Quite early on, Calcutta also had a good neuroscience group as then Chief Minister Dr. B C Roy (himself a medical doctor with both MRCP and FRCS diplomas) brought Dr. T K Ghosh (1912- 1996), a neurologist in July 1951 and Dr. Asoke Bagchi (1925-2005), a neurosurgeon in November 1954. The growth of neurosciences in Calcutta was not as fast as in Chennai or Delhi to start

with but they too picked up momentum soon. In east India there were other neurological stalwarts like Dr. N N Gupta, RN Chatterji and others.

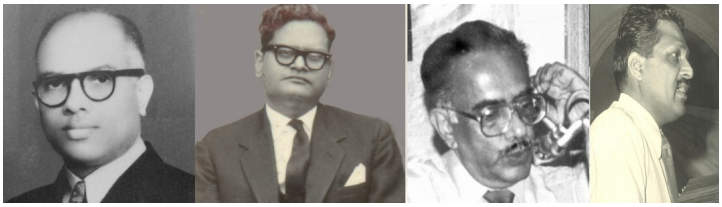
It is with great pleasure that I reminisce my personal friendship to these doyens of Neurosciences in India of yesteryears.

Drs. TK Ghosh, RN Chatterji, Asoke Bagchi and N N Gupta

The Kerala Scenario at Medical Colleges.

Kerala had also by then started neurological centres in a few places. Of course, such speciality care could be envisaged only in the Governmental sector then. It would not be understandable for the present generation of our colleagues the chill penury in all fields of life in Kerala. The economic status of the ordinary folk in Kerala was miserably poor so was also that of the State. There were only Medical Colleges in Trivandrum (started in 1951), Calicut (started in 1957) and Kottayam (started in 1961). By dint of our hard work, speciality services could be started in the first three medical colleges by early 1970s.

As in other parts of India, there were many in the medical College services who were keenly interested in neurosciences even before formal departments of neurosciences came into existence. Dr. Kumara Pillai MD was the Professor of HOD of Medicine in Trivandrum Medical College. Unlike his colleagues then who had only MRCP with specialization in Tropical Medicine, he had taken his MD Medicine from London University with neuropsychiatry as the special subject. He was the chief of the Neuropsychiatry division in Trivandrum heading the Mental Hospital, Trivandrum also before he became HOD of Medicine in TMC. Probably the very best among them was Dr. GK Warrier (*1928-1982).* There were others like Dr. M G Sahadevan, Dr. M Ravindran, and Dr. Bahuleyan who also practised neurosciences even before the formal departments in the Medical Colleges were formed.



Drs. Kumara Pillai, G.K Warrier, M.G Sahadevan and C.B.C Warrier.

Formal Neurosciences departments were initially started in Trivandrum and Calicut and then at Kottayam. Dr. M Sambasivan (1936-2018) took his MS Neurosurgery Degree from CMC, Vellore in 1966 and was appointed Assistant Professor of Neurosurgery at Trivandrum Medical College. This was soon followed by Dr. C. A. Rajan in Calicut returning from his neurosurgical training in Delhi and Dr. K M John (1935-2009) in Kottayam, who took his MCh Neurosurgery from CMC, Vellore. Though Departments of Neurosurgery was started bit earlier than Departments of Neurology in Kerala Trivandrum(1971/72), Calicut (1973), Kottayam (1974), right from the beginning they started developing independently.

Drs. M Sambasivan, CA Rajan. KM John, SK Ramachandran Nair

It was my deliberate decision to go and start Neurology in Calicut Medical College in 1973 and it paid high dividends.

Though in other places there were plenty of cardiologists (almost every physician with a stethoscope claimed to be a cardiologist then!) physicians claiming neurological training were few except in Calicut where Drs. G.K Warrier (*1928-1982),* Dr. C.B.C Warrier (1934-1992), Dr M.G Sahadevan (1929- 2002) and Dr. P.K Abdul Gaffoor (1927-1984) were already practising Neurology along with General Medicine.

It is in their group I was sent to organize a new department of Neurology at Calicut Medical College. Initially every one was skeptical whether I would be allowed to work without problem but I felt an exceedingly good camaraderie among them. The crowd of patients coming to our OPD was bit unnerving and I was allotted a fresh MBBS tutor only from Dept of General Medicine as an assistant. Apart from organizing a new department much against the wishes of many and stiff opposition from the authorities and peers, the department came up wonderfully well.

In addition to the routine patient care, teaching postgraduates in Medicine, Pediatrics and surgery, we took up research work also earnestly. It is quite satisfying to remember now that in my 5 year period from 1973- 1978 there were more than 22 papers published in various journals and 5 excellent papers presented to National Conferences. The first-ever paper from Calicut Medical College presented in an international Conference was from Neurology at the 14th World Congress of Neurology at Amsterdam. I was one of the official delegates of the Neurological Society of India to that conference along with Dr. NH Wadia, Dr. Krishnamoorthi Srinivas and Dr. Valmikinathan (Neurochemist of MMC). Till then every such governmental support for partaking in International conferences (though it was only very infrequently) was selectively confined to Trivandrum Medical College.

Drs. K Rajasekharan Nair, Mathew Cheriyan and A.S. Girija

In those days there was only just one organization to both Neurologists and neurosurgeons- the Neurological Society of India (NSI). My first attendance at NSI was at 1972 Lucknow Conference while I was doing PG in AIIMS. In those days NSI conferences were modest in its celebrations and practically all members, nearly 100 in number, attended the sessions meticulously. Mine was the first free paper in that Session- 'Speech and Language disturbances in Hemiplegics'. That was a great occasion as there was all-round friendship among the very seniors, juniors and novices. We developed mutual friendship and respect as we were small in number and hailing from different parts of India. The practice of holding the annual meet of NSI at different places in India, started from the very beginning.

The NSI used to conduct its annual sessions along with those of the Association of Physicians of India (API) till Jan 1964. In fact, the first time NSI conducted its annual session in Trivandrum (along with API) was in January 1958 when there was none from Kerala to represent neurosciences excepting Dr. V. Kumara Pillai, the then Professor of Medicine at TMC.

It was in this background it was decided to conduct the 1978 annual session of NSI again in Trivandrum with Dr. M Sambasivan as the Organizing Secretary. He had very little help available in Trivandrum and so we decided to form a small organizing group (as NSI would not allow separate State Chapters then). In July 1977 the then available neuroscientists met together at Calicut in my residence to form a small association to organize the NSI annual meet next year. It may look funny now that there were only four of us there – Dr. M. Sambasivan, Dr. S. K Ramachandran Nair, P Sreekumar and I who decided to form a small Organization which was named it as KINS (Kerala Institute of Neuroscientists). The 1978 NSI meet was a great success with more than 600 dele-

gates- Since Dr. Sambasivan was toiling alone without any other help from his colleagues in Trivandrum, Dr. Sreekumar, Dr. Ramachandran Nair and I had to go over to Trivandrum and stayed there for days on end.

Drs. K Rajasekharan Nair, P. Sreekumar and M Sambasivan

It was after that, I left India for my Commonwealth Scholarship and Libyan sojourn. When I returned to Trivandrum as Professor of Neurology in 1982, it was quite saddening to see the desolate Department of Neurology in TMC with 6 beds (4 Male and 2 Female beds- spread out all over the Medical College Hospital) and just one room. Within one year I could manage to develop a department with 20 beds and fairly spacious rooms for the faculty, EEG/EMG studies/ Neurochemistry studies. The utter financial stringency of the Medical College apart, we could get newer equipments for Evoked Potential studies etc. It is with great pleasure I could organize the first-ever DM Neurology program in TMC in 1983. We are indeed proud that DM Neurology of TMC was the first super specialty Degree in Kerala to have given IMC recognition.

With the annual intake of one candidate per year for DM and just 3 or 4 tutors like Dr. Rani Bhaskaran, Dr. Shaji Prbhakaran, Dr. Anandkumar, we could organize very many CMEs, local and National Neurology Conferences in Trivandrum when facilities were meager by today's standards. We could publish more than sixty-five papers during the period of 1982 to 1996 and I insisted all my PGs to present papers at NSI national conferences.

National Stroke Conference in Trivandrum 1987.

Dr. Sambasivan had by then established a great reputation as an excellent organizer in our neurological circle nationally and as the Secretary of NSI he had to shoulder the responsibility of holding three International Conferences in tandem in New Delhi – The World Congress of Neurology, The World Congress of Neurosurgery and International Conference of Epilepsy. There were thousands of delegates for each one of them. No country in the World till then dared to organize these sessions in one year itself, a feat never to be repeated also. We all chipped in as members of different committees. Dr. CU Velurugendran and I were in the Scientific Committee with Dr. K Jagannathan as the convener. All three conferences were great success and India got a lot of praise for the same.

Dr. Sambasivan became the President of NSI for 1996 and I became the President for 1999. It was a pleasant chance for all

of us that the Dec 1998 NSI session was to be conducted in Trivandrum when I took over the President of NSI. As President-elect I had not much of official work in 1998 and I planned to utilize that period to compile a history of Neurosciences in India inviting all past presidents of India to write about their lives and times so that the evolution of Neurosciences in different parts of India could be brought out. The resistance I felt was shocking, some flatly refused, many didn't bother even to reply and a few said perhaps they would think it over. The only three people who agreed with my suggestion readily were Dr. B Ramamurthy Dr. S Kalyaraman and Dr. M Sambasivan.

I wrote each one of the Past Presidents repeatedly requesting for the write-ups. But right from the beginning, I told them that last cut off period would be 31st March 1998. Gradually many understood the historical significance of that proposed book and they gave their write-ups one after the other. Among those who flatly refused in the beginning, many practically begged me later to give them extra time to which I flatly refused. They too obliged to submit the matter in time. Somehow I collected almost all skits but the editing of those papers was a Herculean task. Still a minority few had to be left out. The book 'Evolution of Neurosciences in India' released at the Trivandrum Session of NSI was a momentous event with two of the founding fathers of this organization partook in that function. It was first of such a kind of book in Indian Medicine and many other organizations followed suit.

The NSI Conference in Trivandrum Dec 1998. The Book Release function of 'Evolution of Neurosciences in India'. Drs. B. Ramamurthy, Jacob Chandy, M.Sambasivan and K Rajasekharan Nair.

Indian Academy of Neurology

Right from late 1960's there were many neurologists who were not too happy with NSI where neurosurgeons claimed an upper hand. But the break off point came in 1991 with a few of the members of NSI decided to have a separate organization for Neurologists called Indian Academy of Neurology. Dr. Krishnamoorthy Srinivas, Dr. Chopra, Dr. AKN Sinha and few others formed an initial committee and Dr. Krishnamoorthy Srinivas was selected as the working President. The organization decided to have the first one-day meeting at Ranchi in Oct 1992 but the political turmoil in the place made us to cancel that. In 1993 the first meeting was held and Dr. Chopra was elected the President instead of Dr. Krishnamoorthi Srinivas. Dr.Anupam Das Gupta succeeded Dr. Chopra as the second President. I was elected the third President of IAN. As luck would have it, Dr. Anupam Das Gupta didn't turn up in the 2nd Chandigarh Meeting of IAN organized by Dr. Chopra. I, as the President-elect for the next year, had to act as the President of IAN in that session also, prior to my Session at Hyderabad in 1996. It during the Hyderabad session Founding Fellows of IAN were felicitated. .

By then IAN became more popular with neurologists and NSI gradually became more and more concerned with neurosurgeons. Still NSI has a large number of all neuro specialists- neurologists, neurosurgeons, neuropathologists etc. It is but natural that in the succeeding years local representations required more space and time so that initially local State branches of NSI and IAN were started. Subsections of these organizations and new organizations started coming up from different regions to make the specialities

more vibrant. Perhaps in the present circumstances with the availability of instant access to information by the internet may appear to annihilate the necessity of conferences, but human to human interactions will certainly remain as the most pleasant form of communication in all sorts of knowledge.

Dr. JS Chopra and Dr. K Rajasekharan Nair at Hyderabad Conference of IAN. Distribution of the certificate of Founder Fellow

I acknowledge that this is only a very brief overview and I have left out many important persons and centres for want of space. Even this review of the evolution of Indian neurosciences up to 2000 only, has taken far more space than I initially planned. I wish I could have included the relevance of the work done in many other great institutes (I do not want to name any one of them in particular as they are all excellent centres of learning) but I just could not include them in an overview like this. I shall take it up in a succeeding article soon. This may be excused.

Further Reading

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SCIENTIFIC ARTICLES COLUMN

Three pioneers in Neurosurgery- Kerala

Dr.Arun Oommen
Sr.Consultant Neuosurgeon, VPS Lakeshore Hospital, Kochi

Professor Sambasivan (1936-2018)

He was one of the greatest Neurosurgeons in India and the founder of the first dept of Neurosurgery in Kerala at Govt Medical College Thiruvananthapuram. His contributions to the field of Neurosciences in Kerala and India are exemplary.

Prof Sambasivan hailed from a family of sanscrit scholars who were adept with vedas and Upanishads. His father who was a tantric, wanted his son to be a sanscrit scholar and perform rites in temples just like him but Sambasivan choose the medical profession.

Born on 1st may 1936 Sambasivan was a very brilliant boy and completed school in flying colours along with his sanscrit and vedic education He passed MBBS from Medical College Thiruvananthapuram with six gold medals. He developed passion for surgery and assisted famous surgeons who were trained in India and abroad. He was trained in neurosurgery under Dr Jacob Chandy (First neurosurgeon in India) and cleared Neurosurgery with distinction from the prestigious CMC, Vellore.

In 1966, Dr Sambasivan started the first department of Neurosurgery in Kerala at Medical College Trivandrum. He diagnosed and treated complicated neurosurgical problems like aneurysms, intraventricular tumours, schwanommas etc with the help of basic tests like cisternograms, angiograms and Xrays in an era where CT scan and MRI has not evolved. His exemplary knowledge and skill in neurosurgery was well spread world over.

The first Neurosurgery training programme was started in the state at Medical College Trivandrum under his leadership. Dr Sambasivan became professor in 1975, and was later appointed as consultant Neurosurgeon in the armed forces medical services in 1987. He was the Neurosurgeon to the president of India too, In 1990,he was conferred Honorary FRCS (Glasgow) considering his exemplary contributions to Neurosurgery in India and abroad. He also received the award for the best doctor in the state and retired as the Vice principal of Trivandrum Medical college.

He organized the 9th International congress of neurological sciences in New Delhi in 1989 ,was the secretary of NSI from 1984 to 1990, ,a founder member of the World Federation of Neurosurgical Societies (WFNS, India) trust, and was the vice president of WFNS. He was the founder and first President of NSI Kerala Chapter. He was an excellent teacher, a great orator and a good human being. He was the master brain behind the present Sree Chitra Institute of Medical Sciences . He has trained many Neurosurgeons in the state who as now the top professors and consultants in various parts of the world..

An erudite Vedic scholar and an expert in sanscrit, he had mastered ancient scriptures and four Vedas, in addition to being a tantri to various temples in Kerala, notable among them the Shiva temple in Karamana.

His wife is Mrs. S. Gomathy, two sons, Dr. Mahesh Sambasivan who is also a neurosurgeon and Mr. S. Kumar , only daughter Mrs. Sreevidya Sivakumar.

Prof.(Dr.) K V Mathai

I had the privilege of seeing the birth and development of neurological Sciences in India; first as a curious onlooker, later as an interested bystander and finally as a player in the game and an actor in the drama- Prof K V Mathai

Prof.(Dr.) K V Mathai, is on of the most polite and courteous senior Neurosurgeons in India. He called himself a Neurological surgeon and not a Neurosurgeon. Dr. Mathai was the first person in India who underwent his complete training entirely in India. After working with Dr. Jacob Chandy for several years he became the head of neurosurgery at CME vellore. He was a role model to all as far as clinical diagnostic skills, discipline, surgical skills , patient care and dressing style was concerned.

Prof Mathai as a diligent teacher are well known.
He was the first person in the country to carry out Neuro epidemiological studies on the island of Guam on Amyotrophic Lateral Sclerosis and Parkinsonism dementia complex for which he was honored by the ruler of that country. Dr. Mathai 's series of temporal lobectomies for epilepsy again was a pioneer study. Dr Mathai was trained for microneurosurgery from Zurich which enabled surgeries on AVMs and certain intracranial space occupying lesions ,
Dr. Mathai was instrumental in promoting Neurological Sciences in the North Eastern region of the country, by establishing Departments in Guwahati in Assam, Khatmandu in Nepal. He was also Consultant for several years in Kingdom of Bhutan. He was extremely hard working and used to spend 14-16 hrs for patient care.

Dr. K.M. John

Dr. K. M John was one of the finest neurosurgeons India has seen. He was an aesthetic surgeon with multi faceted personality, a verocious reader, a teacher par excellence and a humanist. He was well versed in so many knowledge spheres and because of his amazing analytical skills and incisive knowledge of varied subjects ranging from science to philosophy he was often described by his friends and colleagues as Intelligent John. He was a chain smoker like many other doctors especially surgeons of yester years.
He belongs to the second batch of MBBS graduates from Medical College, Thiruvananthapuram He completed his MCh Neurosurgery course from CMC Vellore. After his training he started the department of neurosurgery at Kottayam medical college. He named the department Spine and Brain Centre. He contributed enormously to the development of the Neurosurgery department at Medical College Kottayam mostly working alone with only a tutor. He was also an active member of the Lions Club Kottayam.
His aesthetic approach in the theatre was well known. Dr. K. M. John was s a gentle soul par excellence a great surgeon and captivating personality.

Autoimmune neurology the twenty first century subspecialty in neurology

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Autoimmune neurology is the twenty-first century sub specialty in neurology. It includes disorders of all other sub specialties of neurology like epilepsy, movement disorder, cognition, neuromuscular but with an autoimmune etiology. Autoimmune neurological disorders can be associated with a cancer (paraneoplastic) as well without cancer association (non paraneoplastic).

These disorders are under diagnosed and often misdiagnosed. Many a times, these diseases are misdiagnosed as "neurodegenerative disorders" which means practically no effective treatment available. More often autoimmune encephalitis is misdiagnosed as viral encephalitis and mismanaged. But in fact, if properly investigated with appropriate tools (which include disease marker testing in a neuroimmunology laboratory) and diagnosed as an autoimmune neurological syndrome, it becomes potentially treatable and often fully reversible. Early diagnosis is the key factor in recovery. Lack of testing facilities for markers of the disease and lack of awareness among care givers are the two important limitations in diagnosing and treating these diseases.

When to suspect autoimmune etiology?

The spectrum of autoimmune neurology is ever expanding. Starting with the traditional spectrum like Guillan-Barre syndrome, Myasthenia gravis, chronic inflammatory demyelinating neuropathy (CIDP), vasculitis, acute disseminated encephalomyelitis (ADEM), paraneoplastic neurological syndromes and neuromyelitis optica (NMO), now it has expanded to include autoimmune encephalitis, autoimmune dementia, autoimmune epilepsy, autoimmune ataxia and myelopathy, autoimmune brainstem encephalitis, NMO spectrum disorders and autoimmune movement disorders. Virtually any part of central nervous system, autonomic nervous system, peripheral nervous system and muscle can be involved. They can present in any clinical form-from cortex down to skeletal muscle and autonomic nervous system dysfunction. High index of clinical suspicion is the earliest step in making an early diagnosis and treatment.

Here is a rough guideline about when to suspect an autoimmune neurological disorder-The clinical presentation can range from encephalitis, seizures, cognitive decline, optic neuritis, stroke like episodes, behavioral symptoms like psychosis, brainstem encephalitis characterized by cranial nerve and pyramidal involvement, ataxia, movement disorders like chorea and myoclonus, dyskinesias, cerebellar ataxia, myelopathy, plexopathy, radiculopathy, neuropathy, autonomic neuropathy, myopathy and neuromuscular conduction defect-myasthenia

Though the classical description of voltage gated potassium channel (VGKC) antibody is limbic encephalitis and Moorvan's syndrome, the other presentations like paraneoplastic cerebellar degeneration (PCD), gastrointestinal dysmotility, parkinsonism, tremor, chorea, sensory motor neuropathy, hyponatremias, dyssomnia , hyperphagia, facio brachial dystonic seizure, other seizures and presentation mimicking Creutzfeldt-Jakob Disease (CJD) are well described.

NMDA receptor antibodies classically associated with Psychiatric features and memory loss, orofacial dyskinesia, choreoathetoid movements, abnormal posturing or increased tone, catatonic state and central hypoventilation.

NMO IgG has expanded the spectrum of NMO to include optic neuritis and myelitis into NMO spectrum of disorder without the classical presentation of eye and spine involvement. Discovery of MOG IgG further expanded the seronegative NMOSD (Neuromyelitis optica spectrum disorder).

α-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid (AMPA) receptor antibody mediated autoimmune encephalitis presents with limbic encephalitis and seizures. Gamma-aminobutyric acid (GABA) A& B receptor antibody mediated encephalitis presents with limbic encephalitis.

One of the newer additions in the spectrum are dipeptidyl-peptidase-like protein 6 (DDPX) antibody mediated autoimmune encephalitis. One of the characteristic feature of this disease is triad of weight loss/ gastrointestinal symptoms, cognitive mental deficit and CNS hyper excitable. Usually preceeded by diarrhoea, other GI symptoms or weight loss. The other one is Ig LON5 antibody associated disease characterized by sleep disturbances, brainstem symptoms, extrapyramidal syndrome and hyperexcitability.

Considering the ever expanding spectrum of nervous system autoimmunity and its complex clinical picture, the need for expertize in performing and interpreting the tests as well as reports in the clinical context, the guidance from trained autoimmune neurologist is very essential for the clinician.

Clinical features : The tables below show the clinical, laboratory and radiological clues for an underlying autoimmune aetiology in a given clinical scenario.

History	Clinical examination
• History or family history of cancer • History or family history of systemic autoimmunity • History of chronic smoking • Elderly age group • History of cachexia, anorexia and fever	• Multifocal involvement • Significant autonomic involvement • Features of systemic autoimmunity

Laboratory	Radiological
Inflammatory CSF Elevated CSF protein OCB Markers of systemic autoimmunity	Limbic encephalitis Longituidinally extensive transverse myelitis Longituidinal signal changes in spinal tracts

Autoimmune etiology should be strongly sought in all neurological syndromes of unexplained etiology.

Paraneoplastic/autoimmune etiology should be considered in subacute sensory neuronopathy, cerebellar ataxia, limbic encephalitis, opsoclonus/myoclonus, encephalomyelitis, chronic gastrointestinal pseudo obstruction and Lambert Eaton myasthenic syndrome.

However remember that atypical presentations are more common in these disorders. Course can be variable. In view of the treatability and reversibility of the condition as well as the easy availability of an affordable treatment, autoimmune evaluation should be considered in other cases also.

Paraneoplastic antibodies are cancer specific, not disease specific. Same clinical syndrome can be the manifestation of multiple antibodies even in non paraneoplastic syndrome. Hence we discourage testing for single a single antobdy for a give syndrome. Eg- limbic encephalitis can be the presentation of a number antibodies from VGKC, AMPA, GABA to type I anti-neuronal nuclear (ANNA-1).So testing for a single antibody may miss the diagnosis in this case. There can be coexisting antibodies in a given patient.

Management

Management of autoimmune neurological disorders is fascinating to the clinician. The biggest advantage for the clinician here is that they are medically treatable, often respond well to treatment. Sometimes it can be very challenging due to fluctuations, relapses and treatment related complications like infections.

Once the diagnosis is established, treatment options ranges from corticosteroids, immunoglobulin, plasma exchange and immunosuppressive medications like mycophenylate, azathioprine, cyclophopshmide. rituximab and other newer agents. Options depending on the clinical severity of the disease, comorbiditie and disease duration. Duration of the treatment is also variable depnednig on the underlying diagnosis.Some diseases will be treated for short duration and other disease will be treated for longer time. Response to the therapy also determines the duration of the treatment.

GOOD THINGS HAPPEN TO THOSE WHO WAIT…

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Over the last decade, the variety of hardware available for neuro interventional procedures for aneurysms has increased dramatically both in quantity and quality. Those who know the early days of coiling aneurysms will agree unanimously that the coils, micro catheters and micro wires available now are far better. Dreadful problems like coil stretching, micro catheter kick back etc are a rarity in current practice.
Technology has also lead to double lumen balloons that are hyper compliant making balloon assisted coiling easy and extremely safe. In my perspective, the development of better coils, microcatheters and balloon catheters have been the most important technological advances in the last 10 years that definitely helped with better clinical outcomes and catapulted our specialty to its current level.

We have a great deal of work being done with reducing thrombogenicity of intracranial stents and the SHIELD technology with Pipeline Flex flow diverter stent is a prime example. These stents can be used with a single anti platelet medication and Aspirin appears to give adequate protection according to recent experiences. This is a big relief in treating difficult acutely ruptured aneurysms that need flow diversion. Development of small profile flow diverters, like the Silk Vista Baby and FRED junior that can be pushed through 017 '' microcatheters is opening the options available for some difficult distal aneurysms now.

It is also true that a lot of new technology and gadgets take their time to be available in India. This can be a pain but I would consider this as a somewhat useful evil as we have poor regulations in using new devices and either non- existent or very inefficient means of collecting any combined clinical data from the country. Therefore, with delay in launch of new devices, we may be at an advantage that some of the early or even mid -term experiences with the product is already known. This should help us to be wiser. Early results may also lead to improvisation of technology and those who wait have increased odds of getting the better product. I hope all this will apply to the - yet to be available in India - endosaccular flow disruption devices too. The WEB (Woven Endobridge Device) is expected to be available in India anytime now. The device has already undergone significant technical refinements after its initial launch and while WEB has its role in treatment of ruptured and unruptured wide necked bifurcation aneurysms, appropriate case selection and judicious use of the device will be crucial.

ALTERED ACCENT SYNDROME DURING RECOVERY FROM ANTI N-METHYL D-ASPARTATE RECEPTOR ENCEPHALITIS

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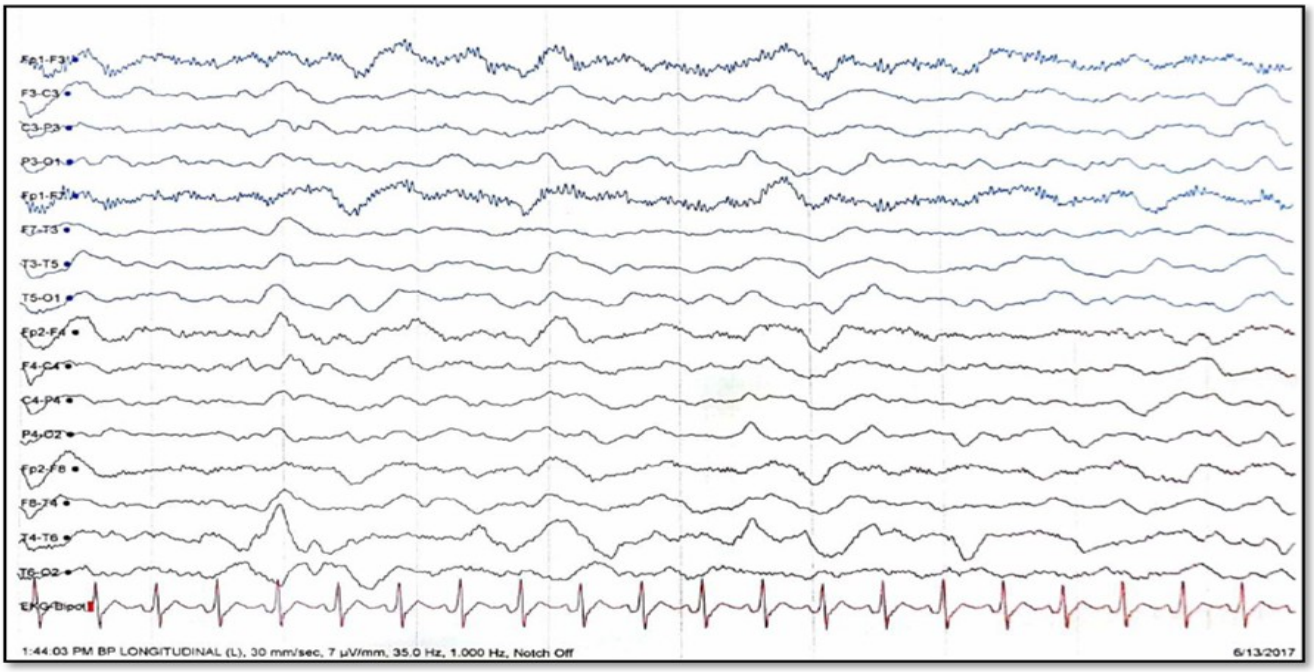
LS, a 29 year old previously healthy lady, presented with history of acute onset of altered sensorium, decreased word output, weakness of all four limbs and urinary incontinence. She had experienced fever with headache, vomiting and diarrhea for four days, one week prior to admission. She had never experienced clinical seizures. She had no past history of cutaneous rash, photosensitivity, recurrent orogenital ulceration or arthralgia. There was no relevant history of exposure to drugs or toxins. The family history was unremarkable.

At presentation she was febrile with a pulse rate of 94 bpm regular and blood pressure of 100/70 mmHg. She was mute and aphasic with flaccid quadriparesis, brisk bilateral upper limb reflexes, absent lower limb reflexes, bilateral extensor plantar response and neck stiffness. Systemic examination was unremarkable. On the second day of admission she began to experience fluctuating heart rate and blood pressure. Two days later she became conscious with persisting word finding difficulty. She also began to respond to simple verbal commands. On the 12th day of admission she developed oromandibular dystonic movements. On the 20th day she began to make incomprehensible sounds and developed inappropriate laughter and motor stereotypies. Four weeks after admission her neurological examination revealed scanning dysarthria, generalized chorea, bilateral limb hypertonia, bilateral cerebellar signs and gait ataxia. Her clinical presentation included a cluster of neurological manifestations such as acute encephalopathy, frontal lobe signs, pyramidal signs, extrapyramidal signs, multiple movement disorders, cerebellar ataxia and dysautonomia

Routine blood investigations revealed thrombocytopenia (platelet count: 85000/mm3), elevated erythrocyte sedimentation rate (ESR: 50mm /Hr) and deranged liver function tests. The rest of the biochemical and hematological investigations were normal. Noncontrast CT head and MRI Brain were unremarkable. A routine CSF study was unremarkable.[WBC:2 cells/uL, protein: 46 mg/dl, sugar: 61mg/dl].Electroencephalogram demonstrated diffuse asymmetrical slowing (right>left) and extreme delta brushes. Nerve conduction study demonstrated decreased CMAP and NCV in bilateral peroneal, left median and bilateral ulnar nerves. Repeat EEG and MRI brain performed 10 days after the initial investigations were unremarkable. Abdominal ultrasonography did not reveal any ovarian or adnexal lesions. Serum viral markers (Dengue NS1, JE PCR, HSV IgM, HAV IgM, WestNile antibody and HIV ELISA) were negative. Serum B12 was 226 pg/ml, Serum Ceruloplasmin and 24 hour urine copper were normal. VDRL was nonreactive. Peripheral blood smear demonstrated microcytic hypohromic RBCs, leucocytosis with neutrophilic preponderance, mild shift to left and thromocytopenia. Serum antithyroid antibody, antinuclear antibody and antiphospholipid antibody tests were negative. Autoimmune and paraneoplastic work up (GABA B receptor antibody, Glutamate receptor antibody - N-Methyl D-Aspartate Receptor, Contactin Associated Protein 2 antibody, Leucine rich Glioma Inactivated 1 antibody, Alpha –amino- 3- hydroxy-5-methyl-4-isoxazoleprionic acid [AMPA]1 &2 antibodies) in blood and CSF were negative. She received treatment with IV methylprednisolone (1 gm /day) for 5 days, ceftriaxone, meropenam, acyclovir, levetiracetam and six sessions of plasma exchange.

At the time of discharge she was conscious and oriented with inappropriate jocularity and she spoke with an altered accent of speech, though not foreign or alien but resembling a dialect from North Kerala. She was discharged on oral steroids (prednisolone 40mg/day). At 2 week follow up she showed improvement in her

speech pattern and other neurological deficits with residual subtle cerebellar signs. Oral steroid was tapered and stopped over a period of 2 years and levetiracetam was continued. Anti –NMDA receptor encephalitis is frequently recognizable on clinical grounds and is associated with highly specific CSF IgG antibodies against the GluN1 subunit of the NMDA receptor. The disease has a female sex predominance of 4:1.The frequency of underlying tumour varied with age and sex, ranging from 0-5% in children (male and female) younger than 12 years, to 58% in women older than 18 years (usually an ovarian teratoma).Adults older than 45 years have lower frequency of tumours (23%) and these are usually carcinomas.



Diagnostic criteria for anti-NMDA receptor encephalitis Probable anti-NMDA receptor encephalitis

Diagnosis can be made when all three of the following criteria have been met:

1. Rapid onset (< 3 months) of at least four of the six following major groups of symptoms:

a. Abnormal (psychiatric) behaviour or cognitive dysfunction
b. Speech dysfunction (pressured speech, verbal reduction, mutism)
c. Seizures
d. Movement disorder, dyskinesias, or rigidity/abnormal postures
e. Decreased level of consciousness
f. Autonomic dysfunction or central hypoventilation

2. At least one of the following laboratory study results:

a. Abnormal EEG (focal or diffuse slow or disorganised activity, epileptic activity, or extreme delta brush)
b. CSF with pleocytosis or oligoclonal bands

3. Reasonable exclusion of other disorders.

Diagnosis can also be made in the presence of three of the above groups of symptoms accompanied by a systemic teratoma **Definite anti-NMDA receptor encephalitis** Diagnosis can be made in the presence of one or more of the six major groups of symptoms and IgG anti-GluN1 antibodies, after reasonable exclusion of other disorders.

Primary Amoebic Meningoencephalitis

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Introduction

Free living protozoa can occasionally infect human beings and can cause deadly disease. These include Acanthamoeba spp., Balamuthia mandrillaris, Naegleria fowleri and Sappinia diploidea(1). Nagleria and Sappinia have an acute meningitic presentation and usually affects immunocompetent individuals while Balamuthia and Acanthamoeba produce a granulomatous meningitis and usually presents as chronic meningitis in immunocompromised and debilitated individuals(1). Both Balamuthia and Acanthamoeba can infect the skin and lungs as well. Acanthamoeba can also cause a vision threatening keratitis(2). Primary Amoebic Meningoencephalitis (PAM) is a rare and fatal Meningoencephalitis caused by free living flagellate protozoan Naegleria fowleri with case fatality of more than 95% (3).

Epidemiology

Naegleria fowleri has a world-wide distribution and it has been isolated from fresh water and soil. It is ubiquitously found in warm fresh water sources like lakes, pond, streams and rivers. It usually prefers temperature above 30 degree and is not seen in sea water. There is concern regarding increased occurrence of disease due to global warming. It has 3 stages in its life cycle namely trophozoite, flagellate and cystic stage. The trophozoite is the usual infective stage (4). Water containing the trophozoite and flagellate stages of Naegleria may reach nasal cavity during swimming, bathing, water sports or during ritualistic nasal cleaning (5)(6). Drinking of contaminated water has not been shown to cause the illness. From nasal cavity it reaches the brain through the nasal mucosa and going through the cribriform plate. Inside brain it causes cerebral oedema and patient finally succumb to disease due to herniation(4). History of exposure to contaminated water is obtained in 80% of cases(7). Infection is rare compared to exposure. Risk of infection is only 2.6 per million exposure(8). It is more common in children and young adults. In one of the largest case series of PAM reported from United States the median age was 12 years and 76% were males. Most were immunocompetent and only 3 of the 141 patients survived(3). Infection is more common in summer season.

Clinical features and diagnosis

Patients presents with meningitic symptoms including headache, vomiting, fever, neck stiffness, altered sensorium and seizures 1-9 days after exposure to Naegleria contaminated water in nasal cavity. Anosmia and decrease in taste sensation can occur initially due to involvement of Olfactory nerves. Physical examination may show neck stiffness and features of raised intra cranial tension including Papilledema and Sixth Cranial Nerve palsy. The disease worsen rapidly and death usually occurs 1-18 days after onset of symptoms(3). The clinical features usually suggests an acute bacterial meningitis. CSF study usually shows polymorphonuclear pleocytosis with high protein and low sugar consistent with bacterial meningitis. The CSF is often haemorrhagic. The diagnosis of PAM is often made incidentally when the CSF wet mount examination show the motile trophozoites underlining the importance of CSF wet mount examination in all suspected bacterial meningitis cases. It should be suspected in cases of acute meningoencephalitis with haemorrhagic CSF and usual viral and bacterial studies negative and patient worsening despite meningitic dose of empirical antibiotics more so if they have history of exposure to water sports. Phase contrast microscope helps to visualise amoeba. Giemsa and Trichrome staining help to study the trophozoite morphology properly(9). PCR helps in diagnosis but unfortunately is not available widely. Antibody to Naegleria has been detected in healthy individuals, but since PAM is a rapidly fatal disease rise in antibody titre is not a very useful test(10)(11). Naegleria can be cultured on non-nutrient agar coated with enteric bacteria(12). The imaging findings with CT and MRI Brain is non-specific. The imaging can show meningeal enhancement and haemorrhagic infarcts and necrosis(13). Only in less than 30% cases the diagnosis is made pre- mortem(7). Post mortem the brain tissue can be examined for trophozoites and brain tissue stained for immunofluorescent anti
-Naegleria antibody(14)

Treatment

PAM is a rapidly fatal disease and optimal treatment strategies is still not clear. Amphotericin B has good invitro activity and is the most commonly used drug(15). Conventional preparations are better than Liposomal

Amphotericin. Azoles, rifampicin and azithromycin have synergistic action and is often used along with Amphotericin B(16). Recently anti- leishmania drug Miltefosine has been found to be active against Protozoal infections including Naegleria, Acanthamoeba and Balamuthia(17)(18)(19). The use of combination antibiotics including Miltefosine and Amphotericin, aggressive anti oedema measures along with the use of therapeutic hypothermia for neuroprotection have given some hope regarding the outcome of patients diagnosed with this fatal illness. Early diagnosis and supportive care is critical for having a favourable outcome(18).

Case Vignette

A 12 year old girl with no significant past illness presented with fever, headache and mild disorientation of 3 days duration. On examination she had neck stiffness and mild blurring of nasal margin on fundus examination. There was no other localizing signs. The possibility of acute meningoencephalitis was considered and MRI Brain showed mild meningeal enhancement consistent with the clinical diagnosis. CSF study showed elevated opening pressure with polymorphonuclear pleocytosis, high protein and low glucose consistent with bacterial meningitis. However the CSF wet mount slide showed many mobile trophozoites of Naegleria fowleri. Diagnosis of PAM was made and child was immediately started on Amphotericin B, Rifampicin, Fluconazole and Azithromycin along with anti-oedema measures. Miltefosine was not available. She had no history of swimming in fresh water or exposure to any water sports. Guarded prognosis was explained to relatives. The child's sensorium progressively worsened and she succumbed to her illness in 12 hours due to cardiac arrest possibly secondary to brain oedema and central herniation.

Comment

This is the classical presentation of PAM caused by Naegleria fowleri. The clinical picture, imaging and CSF study will very much resemble bacterial meningitis. This case illustrates the importance of routinely looking at the CSF wet mount in all meningitis cases. The mobile trophozoites can be easily visualised in wet mount which will confirm the diagnosis and helps in early initiation of treatment. Other protozoans like Acanthamoeba and Balamuthia usually presents as subacute meningitis and trophozoites are usually not visualized in CSF. History of nasal contact with contaminated water need not be there in all cases of Naegleria as illustrated in this case.

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Review of relevance of stereotactc neurosurgery and case series

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Acknowledgement for guidance: Prof. Dr. Jacob P. Alapatt,

Introduction:

Stereotactic surgery is now an essential tool of modern neurosurgery. It is needed for biopsy of small deep lesions and drainage of deep abscesses. Functional neurosurgery is another area of stereotaxy. It is an evolving field with hopeful treatment for movement disorders. The basic principle is to convert the imaging into x, y and z co-ordinates and do the procedure with the guidance of the system.

History:

History of Stereotactic neurosurgery started with the first stereotactic frame described by Horsley and Clarke in 1908[1]. Victor Horsley (neurophysiologist and neurosurgeon) and Robert Clarke (mathematician) published the first 3D targeting technique for human neurosurgery in the journal *Brain* in 1908 . They described about lesioning targets in monkey brain , based on skull landmarks, using an apparatus made of brass. They coined the term "stereotaxis". The Greek word stereos means "3D" and taxis means "orderly arrangement". Spiegel et al. described stereotaxy in relation to the skull radiographs , using pneumoencephalograms and the calcified pineal gland[2]. Spiegel and Wycis described the first use of stereotactic devices in humans. Leksell developed an arc-radius stereotactic frame with rigid frame immobilization using skull pin fixation[3]. Stereotactic neurosurgery advanced in the 1970s and 1980s with the use of CT (computed tomography) and MRI (magnetic resonance imaging) scans[1].

Principles:

The principle of stereotaxy is to define a point by specifying three Cartesian coordinates, anterior-posterior (AP), lateral and vertical[4]. The principle of arc-centered stereotactic frame is to maximize precision at the target[5]. Mini-frame maximises precision at the entry point and replicates the planned trajectory. The steps are frame application, image acquisition, image manipulation, planning of the target and trajectory, positioning and the procedure. The stereotactic frame should be firmly secured to the skull to avoid any movement. Although CT imaging does not suffer from image distortion, anatomical detail is less in comparison with MRI. Thin-slice images through the target are required. The use of contrast media will show vessels which should be avoided in the trajectory. The target coordinates can be calculated from a selected target slice manually . A dedicated software platform can do precise planning of both target and trajectory. The trajectory should avoid sulci and ventricles to reduce the incidence of hemorrhagic complications[6]. Cortical and subcortical brain shift which occurs due to CSF loss, can result in errors[7]. This can be reduced by saline irrigation after dural opening, avoiding CSF suction, and sealing the dural defect.

Uses:

Uses of stereotaxy are biopsy of intraaxial lesions, aspiration of intracerebral abscess, internal shunt implantation, aspiration of basal ganglia haematomas with insertion of an external drainage and excision of small deep-seated lesions[8]. Indications include small size of the lesion, deep location, lesion in an eloquent site, the need for multiple biopsies from a heterogenous mass, a cystic lesion which needs drainage after biopsy of the wall, and to make the procedure the least hazardous in a poor risk patient[9].

Stereotactic neurosurgery can be useful for the treatment of movement disorders viz. Parkinson's disease (PD), essential tremor (ET), and dystonia[10]. The targets are the subthalamic nucleus (STN) and the globus pallidus internus (GPi) for PD, GPi for dystonia, and ventralis intermedius (Vim) nucleus of the thalamus for ET. Deep brain stimulation (DBS) of the subthalamic nucleus (STN) is now a commonly done for uncontrolled Parkinson's disease , in centres[11]. Anterior cingulotomy for major depressive disorder (MDD) and anterior capsulotomy for obsessive-compulsive disorder(OCD) are being done in specialist centres[12]. Deep brain stimulation(DBS) for anorexia nervosa is experimental and has been tested in small number of patients.

Common devices:

The most commonly used stereotactic devices are Brown-Roberts-Wells(BRW), Cosman-Roberts-Wells(CRW) and Leksell frames[13]. Brown-Roberts-Wells (BRW) unit is a highly accurate instrument for locating intracranial lesions based on CT scan[14]. It is modified to be compatible with magnetic resonance imaging (MRI)[15].

The head ring is constructed of a non-ferromagnetic aluminum ring. The new localizing device allows BRW stereotactic coordinates to be calculated from coronal and sagittal MRI images. The stereotactic surgery planning software , created for use with the Brown-Roberts-Wells (BRW) stereotactic frame, facilitates its use as a low-cost alternative[16]. CRW and Leksell frames are used widely for DBS[17]. But, they are uncomfortable for the patient, because they surround the head, and they reduce the freedom of motion. Leksell stereotactic system (LSS) can target with submillimeter spatial resolution[18]. A novel software is developed for digital manipulation to get accurate superposition and validation. Biostereometrics Group and the department of neurosurgery of University of Cape Town, have developed a simple probe pointing device, to overcome the difficulties of cumbersome frames[19]. Cape Town Stereotactic Pointer is based on stereophotogrammetric principles, and uses CT or MRI as the imaging modality.

Accuracy:

The diagnostic yield of stereotactic biopsy of lesions less than a cubic centimeter size is 76.2% and for those larger than this size is 94.8%[20]. In a series of 500 cases, Apuzzo et al. claimed realization of procedural objectives in 95.6% of the cases[21]. The objectives were: histological and microbiological assay, cyst and abscess aspiration, installation of drainage conduits, brachytherapy, ventriculoscopy and intraoperative vascular localization. The overall diagnostic accuracy correlates with the number of bits obtained by stereotactic biopsy[22]. Jain et al. have reported that the accuracy increased from 76.5% for single biopsies to 84% and 88.2% for 2 and 3 bits, respectively, and 100% for biopsies with 5 to 6 bits.

Complications:

Intracranial haemorrhage is the most common complication of stereotactic biopsy, followed by infection and wound dehiscence. [23]. Chance of haemorrhage is more in elderly and if there is hydrocephalus and or cerebral edema. Mortality and morbidity is more after haemorrhage. The complications of deep brain stimulation include hemiparesis , infection, dysphasia, confusion, vasovagal attack , lead migration and erosion[24,25]. An aneurysm of a frontal cortical artery following stereotactic biopsy of astrocytoma in a 3-year-old child was reported[26]. It was discovered when craniotomy was done to excise the tumor .

nce robots, have been used to perform stereotactic brain biopsy. In a series of 100 frameless robotic biopsies using ROSA device, histological diagnosis was established in 97 patients. Six patients experienced transient neurological worsening[28]. The future trend toward miniaturization, frameless registration, and accuracy favour robotic stereotactic systems[29]. Indications for robotic assistance are stereotactic biopsy, deep brain stimulation and stereoelectroencephalography electrode placement, ventriculostomy, and ablation procedures.

Case Series:

Total of fourteen patients had underwent stereotactic procedures. Ten cases were done with CRW (Cosman,Roberts & Wells) frame. All were positive biopsies with accurate diagnosis in 9 cases. The procedure was therapeutic in 2 patients. The diagnoses were anaplastic glioma(2), glioblastoma multiforme(2), metastases(2), lymphoma, tuberculoma, fungal abscess and bacterial abscess. The procedure was therapeutic in cases of fungal and bacterial abscesses, since drainage was done. One patient with anaplastc glioma had drowsiness due to brain edema which responded to mannitol. One patient with abscess had seizure which responded to sodium valproate. Four cases were done with Cape Town Stereotactic pointer(CTSP). Three were cases of glioblastoma and one was abscess. There were no complications. CTSP was more user friendly because of less space needed. Craniotomy could be done for excision of abscess, within the confines of the ring of CTSP. So, accuracy was 93%(13/14) and minor complications were seen in 2 out of 14 patients (14%).

Illustrative cases:

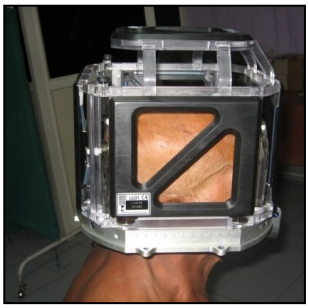
1, A 65 year old male had left thalamic tumour. Stereotactic biopsy was planned. Brown-Roberts-Wells localiser frame was fixed with pins onto skull under local anaesthesia(fig. 1a). CT brain was taken with localizer frame and x,y and z coordinates of the lesion were measured(fig.1b). Localiser frame was removed. He was shifted to operation theatre. Cosman-Roberts-Wells arc was connected and measurements were applied on that. Burr hole was done and biopsy was done through the hole after fitting biopsy needle of the instrument onto the arc (fig.2). There was no postoperative complications. Histopathology report came as metastasis from small cell carcinoma. He was referred to oncology department.

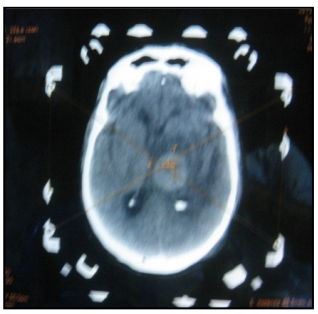
2. A 25 year male with congenital heart disease had left basal ganglia abscess. B.R.W. localizer frame was fixed and CT brain was taken. Coordinates of the lesion was measured (fig.3a). Burr hole was made and drainage was done through the aspiration needle connected to C.R.W. arc. 20 ml pus was drained. Postoperative CT brain showed near total evacuation. He had seizure which responded to sodium valproate. Parenteral antibiotics were continued for three weeks and he improved.
3. A 21 year old man had left deep frontal lesion with edema (fig.4a). He was given empirical antitubercu-lous treatment initially. But he did not improve clinically. Stereotactic biopsy was done in C.R.W. frame. Necrotic material was drained and thick pus was aspirated. Fungal stain showed Chromomycosis (fig 4b). He improved with antifungal therapy.
4. An 87 year old male had seizure, loss of consciousness and left hemiplegia. MRI brain showed ring enhancing lesion with edema in right frontal lobe (fig. 5a). Relatives were not willing for open surgery because of advanced age. So stereotactic biopsy was planned. Cape Town stereotactic pointer was used. Halo ring was fixed onto scalp with sutures (5b). CT brain was taken with ring for the x,y and z coordinates of the lesion(fig. 6a). He was shifted to OT. Measurements were applied to the phantom frame. The pointer was fixed to the phantom frame and the biopsy needle was inserted through the pointer. The direction of the biopsy needle was fixed to touch the point in the phantom corresponding to the lesion. The pointer was fixed to the ring and the point of entry was marked. Burr hole was made at the point. Biopsy needle was inserted through the pointer and the burr hole. Fluid from the lesion came through the needle. Biopsy was taken. He improved postoperatively. Weakness was relieved. Histology report came as glioblastoma (fig. 6b). But relatives were not willing for adjuvant treatment.

Conclusion:

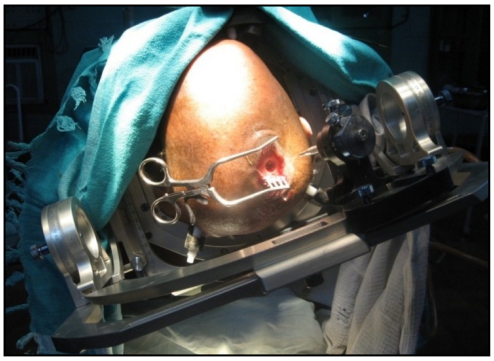
Stereotactic surgery is very useful for the histological diagnosis of deep lesions of brain and for the drainage of deep abscesses. Functional neurosurgery also uses stereotactic guidance. The accuracy of the procedures ranges from 76 to 100 percentage. Complications are less, of which intracranial haemorrhage is the major one. In the series of 14 cases , 13 had accurate diagnosis(93%) and 2 had minor complications (14%).

Figures:1a- Brown-Roberts-Wells localiser frame fixed to skull ; b- CT brain taken with frame, measuring x, y and z coordinates of the left thalamic lesion.

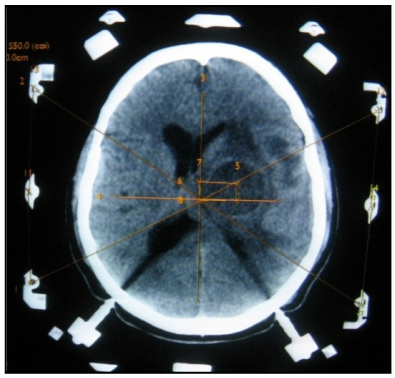
1a. 

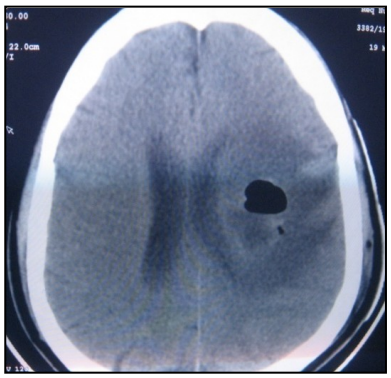
1b. 

2. Biopsy through burr hole after connecting to Cosman-Roberts-Wells arc .

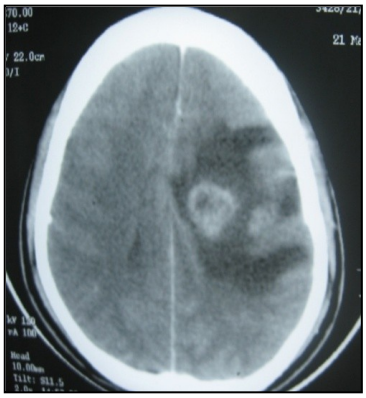
2. 

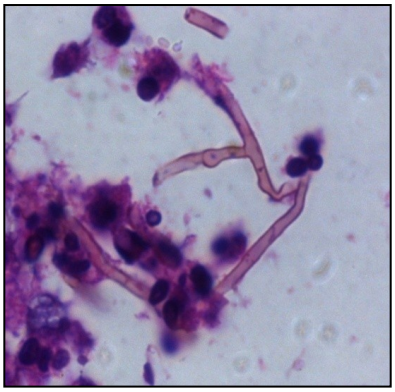
3.a- CT brain with frame showing coordinates of left basal ganglia abscess; b- Postoperative CT brain showing near total evacuation of abscess.

3a. 

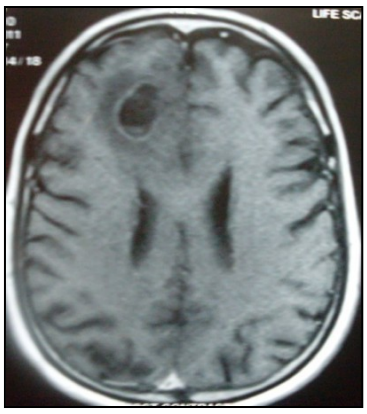
3b. 

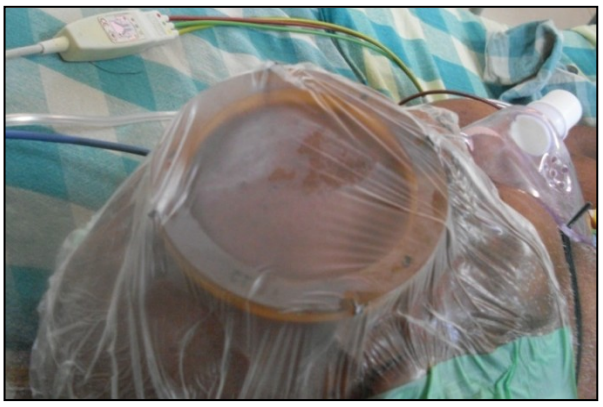
4a- CT brain showing left deep frontal lesion with edema; b- fungal stain showing Chromomycosis.

4a. 

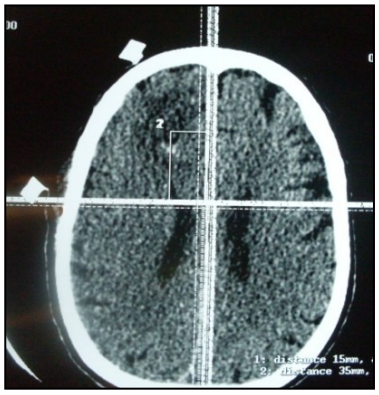
4b. 

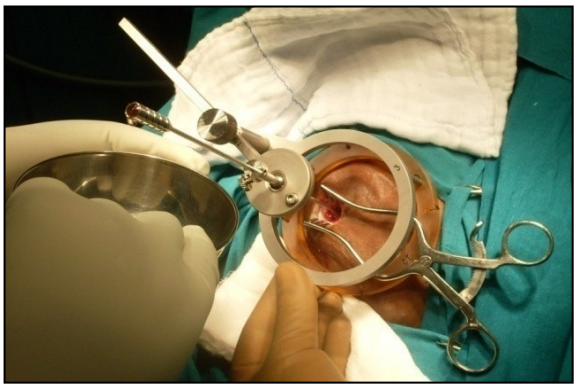
5a- MRI showing ring enhancing lesion in right frontal lobe; b- Halo ring of Cape Town stereotactic pointer fixed to scalp.

5a. 

b. 

6a- CT brain with ring showing coordinates of the lesion; b- Fluid from the lesion coming through the biopsy needle in the pointer.

6a. 

6b. 

PICTURE GALLERY

Dr. P.Sreekumar

one of the senior most Neurosurgeon in the state receiving the Lifetime Achievement Award from the Neurological Society of India in the year 2019 Dr .Athul Goel, Dr.Suresh Nair and Dr.Muthukumar presenting the award

Dr. Mohanlal Divakaran

one of the senior most Neurosurgeon in the state receiving the Lifetime Achievement Award from the Kairaly Neurosciences Society NSI Kerala Chapter in February 2018 at the annual meeting Vembanad Neurocon 2018 at Kottayam. Dr.Suresh Nair presenting the award in presence of Senior executive members Dr.P.K.Balakrishnan, Dr.Abraham Kuruvilla(President 2018), Dr.Raj S. Chandran (Secretary) and Dr.Sudish Karunakaran

PICTURE GALLERY

CALLOSUM 2019

Kairaly Neurosciences Society NSI Kerala Chapter Annual Meeting conducted at Kochi

Commodore G Prakash was the Chief Guest

Org. Chairman **Dr. P Subramaniam,,**Vice Chairman,**Dr. Sujith Panikar,**Org. Secretary **Dr. Biji Bahuleyan,** Joint Org. Secretary **Dr. Vivek Nambiar ,**Treasurer **Dr. Sandeep Padmanabhan,** **Dr. Dilip Panikar,**(Scientific Committee Neurosurgery),**Dr. Anand Kumar,**(Scientific Committee Neurology) **Dr. Santhosh Thomas**(Pre Conference Workshop) **Dr. Sudish Karunakaran,**(Finance Committee) **Dr. Zia Mydin** (Banquet and Entertainment),**Dr. Arun Oommen**(Souvenir)

PICTURE GALLERY

CALLOSUM 2019

PICTURE GALLERY

Kairaly Neurosciences Society NSI Kerala Chapter Mid term Meeting at Kannur in November 2019

Dr.A.P. Srinivas IPS SP Crime branch Kannur was the Chief Guest

Org. Chairman **Dr. JithendranathP.** Org. Secretary **Dr. Suhas K.T**

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Webmaster KNS

From the editorial key board .....!

BODHI - The newsletter & e journal is the combined effort of senior and junior members of the Kairaly Neurosciences Society and its is the first of its kind released from Neuroscientists of all the specialties in our state . The concept of adding the scientific materials is to exchange more of knowledge between the specialists and keeping the reading material off stream from a regular newsletter. The name "BODHI" was suggested by Dr. P. Sreekumar our patron was more than an apt title for this reading material as it implies `a conscious and creative brain' encouraging the younger generation members in the science.

Post graduates are also invited for writing up scientific articles so that youngest generation in the science gets learning opportunities from the more experienced and experts in the field. We request all the members to contribute with their views and articles for enrichment of our future editions.

Upload of the articles is made very simple through website URL-www.nsiikc.com/articles-upload/ for the reach of all members in the state.

BODHI `s endeavor is to move forward in scientific excellence through "dedication, discipline and determination" with our "easeful perception, peaceful mind and useful life". We thank all the members who contributed for this first edition.

With Best Regards from Bodhi team

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