



Radiobiology at KMC, Manipal – Past, Present and Future

At the outset, I thank the Association of Radiation Oncology of India (AROI) for nominating me for the prestigious PK Haldar oration for the year 2014. I deem it as an honor and privilege.

Few words about the Great Dr Haldar

Dr Haldar passed his DMRE in 1941. He served the Indian Army as radiologist as a Major in IAMC. In 1949 he took charge of the department of radiology at S.N.Medical College. In 1966, he joined All India institute of Medical sciences, New Delhi where he served for three years as Prof. of Radiology. He later joined as Prof and head of the Department of Radiology at GSVM Medical College Kanpur. He was the president of IRA and in 1971 he was the president of 24 Indian Congress of Radiology, Kolkata and was an advisor to ICMR on cancer.

The Inception

The Radiobiology as a unit under the department of radiotherapy and oncology was established at Kasturba Medical College Manipal in June 1984. The department of radiobiology was officially inaugurated by Dr. Raja Ramanna, who was then the Chairman of Bhabha Atomic Research Centre and later became scientific advisor to the Government of India. Kasturba Medical College is the first medical college in India to establish a Radiobiology department under a medical college. The division is also undertaking national and international collaborative research projects. With its excellent credentials in the field of cytogenetics, the department has been accredited the status of Biodosimetry Centre by Atomic Energy Regulatory Board (AERB), Dept. of Atomic Energy, Govt. of India. This is one among the three centers chosen by AERB in India.

Radiation Oncology: The Integrated branch of Medicine

Radiation Oncology is one of the few branches in medicine where there is an integrated approach among the departments of Radiation Oncology, radiation physics and radiobiology. There exists true translational research from laboratory

(Continued on page 2)

From AROI office & ICRO Editorial Board

This 1st quarter of the year has been quite eventful for me personally as I tried to make an assessment of Radiation Oncology Knowledge & Learning centres across India..

India is truly a land of diversity. At one end we have centres equipped with latest equipments and well experienced faculty and on other end we have centres which are below par.

Challenge before AROI is to bridge this gap. During last annual AROI meet it was decided to make various steering committees which will look into various core activities. I encourage everyone to contribute in the same individually and collectively so that we could develop a well learned and strong Radiation Oncology community.

With warm regards.

Dr. Rajesh Vashistha
Secretary General AROI

National Women Cancer Awareness day celebrated

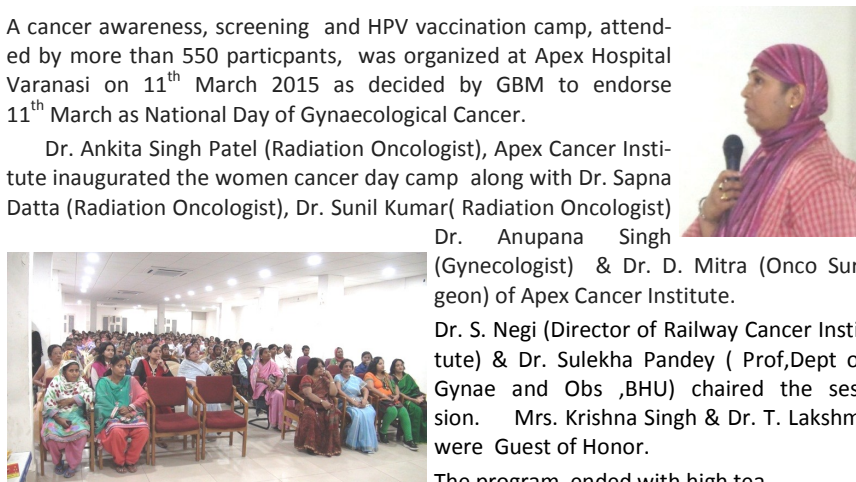
A cancer awareness, screening and HPV vaccination camp, attended by more than 550 participants, was organized at Apex Hospital Varanasi on 11th March 2015 as decided by GBM to endorse 11th March as National Day of Gynaecological Cancer.

Dr. Ankita Singh Patel (Radiation Oncologist), Apex Cancer Institute inaugurated the women cancer day camp along with Dr. Sapna Datta (Radiation Oncologist), Dr. Sunil Kumar (Radiation Oncologist)

Dr. Anupama Singh (Gynecologist) & Dr. D. Mitra (Onco Surgeon) of Apex Cancer Institute.

Dr. S. Negi (Director of Railway Cancer Institute) & Dr. Sulekha Pandey (Prof, Dept of Gynae and Obs, BHU) chaired the session. Mrs. Krishna Singh & Dr. T. Lakshmi were Guest of Honor.

The program ended with high tea



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to bedside. For example, Thomas Strandquist, who is the physician, explained the relationship between the total dose of radiation and overall treatment time. He observed that slope of the line for skin on double log plot is usually 0.33. Based on this finding, Ellis (physicist) and Orton (physician) contributed towards NSD concept in radiotherapy. It was Dr. Denekamp (physicist) who conceived the idea of repopulation. The 4Rs of radiation oncology in relation to fractionation was propounded by Dr Rodney Withers (physician) who also studied the biological basis of altered fractionation. L-Q Model and BED (Biologically effective dose) was conceived by Fowler, who is radiation physicist, supported by Hal Gray, radiation biologist and inspired by radiation oncologists Fletcher and Suit. LQ model has some lacunae - it cannot be utilized for high dose rate per fraction, it does not account for vascular damage, apoptosis, a heterogeneous tumour and immunity in in-vivo tumours. Hence recently radiation physicists are working on developing radiobiological modeling by using the Monte Carlo system. All these developments are possible only by collaboration of radiation physicist who helps in dosimetry, radiobiologists who develop models for TCP/NTCP towards better clinical outcomes as seen by radiation oncologists.

Research at KMC, Manipal

Research collaboration between radiotherapy and radiobiology at Kasturba Medical College includes radio-sensitisers, radio-protectors, predictive assays and laser spectroscopy.

Radiosensitiser

One of the first studies was to assess the efficacy of guduchi, a plant product from *tinasporacordifolia*, as a radiosensitiser in carcinoma cervix. In addition, radio-sensitising effect of Guduchi on hela cells were studied with varying doses of radiation. It was observed that the effect was linear and quadratic. At the same time guduchi was administered to carcinoma cervix patients to study the radio-sensitising effect. A total of 201 patients were included in this study, randomized to Guduchi mixed with chocolate powder (to off-set its pungent taste) or chocolate powder alone. Kasturba Medical College, Manipal and Calicut Medical College, Kozhikode participated in this study. A poor compliance to the mixture of guduchi and chocolate powder was encountered. Although animal studies showed radio-sensitising effect, the same could not be translated in this clinical trial.

Radioprotectors

Radio-protective effect of *Aegle marmelos* (L.) Correa (Bael leaf) in cultured human peripheral blood lymphocytes exposed to different doses of γ -radiation and quantification of micronuclei obtained were studied. A similar study on mice also proved the radio-protective effect of *Aegle marmelos*. A study was conducted on mice treated with total body irradiation with and without leaf extract of jamun (*Syzygium cumini*), which showed that the extracts delayed radiation sickness and death in the mice. Radiobiological studies demonstrated radio-protector property of these plant extracts.

A clinical study was conducted to find out the possible radio-protective effect of curcumin in the patients receiving chemora-

diation for head and neck cancer. Forty three patients were included in this study. Contrary to the literature it was observed that oral mucositis was more when compared to the controls, however greater proportion of patients achieved loco-regional control rates.

Predictive assays

The department of radiobiology in collaboration with radiation oncology was involved in various studies to predict response to radiation. As the radiation treatment is fractionated and usually for 5 to 7 weeks, the prediction of response to treatment is critical in deciding if the treatment needs modification. The predictive assays were conducted in head and neck, cervix and esophageal cancers. The assays include GSH, peripheral lymphocyte studies cultured in vitro and comet assay to assess the DNA damage. Some studies include:

The frequency of micronucleated binucleate lymphocyte (MNBNC) was determined in the peripheral blood lymphocytes of patients suffering from various types of cancer before the onset of radiation treatment, middle (mid-) of the treatment and after completion of the treatment (post-treatment). The baseline frequency of micronuclei was higher significantly in the pre-treatment sample of cancer patients when compared with the normal untreated healthy volunteers. During the middle of the radiotherapy an approximate two or >two-fold increase was observed in the micronuclei frequency in most of the patients when compared with their pretreatment samples. Immediately after the completion of treatment, the frequency of micronuclei further increased, and this increase was significantly higher than that of pretreatment and mid-treatment samples.

This was also shown in a clinical study of 100 patients of H&N and esophageal cancers when the frequency of MNBNCs periodically rose every week as compared to the previous week.

In one study of cervical cancer patients, blood was collected after two fractions, whereas both blood and biopsy were collected after five fractions of radiotherapy in separate groups of subjects. Serum for total GSH content and biopsy sample was processed for DNA damage analysis by single-cell gel electrophoresis (SCGE) assay. Serum GSH values depleted significantly after a total dose of 4 Gy and 10 Gy of radiotherapy with a single dose of cisplatin, which was significantly lesser in non-responders (NR) than of complete responders (CR). The DNA damage after 5h RT in the NR subgroup was significantly lower than that of CR.

A study was conducted to explore the feasibility of serum protein profiles for monitoring tumor radiation response in cervical cancers using the indigenous HPLC-LIF system. Twenty-one subjects were recruited in the study - 7 were healthy, 14 were cervical cancer patients who undertook fractionated radiotherapy (RT). Serum chromatograms of 'normal' ($n=7$) and conspicuous probes before RT ($n=14$, 'malignant') and 24 h after second fraction of RT ($n=13$, '2-RT'), were recorded. Protein profiling of serum samples differentiated 'normal' from 'malignant' subjects, but could not differentiate complete responders ($n=10$) vs partial or non-responders ($n=3$).

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To explore the feasibility of prediction of tumor radiation response, Raman spectra of cervix cancer tissues were collected before radiotherapy, after the 2nd and 5th fraction of radiotherapy (RT) were recorded. Raman spectroscopy gave clear classification between responding (complete and partial response) and non-responding patients, thus proving its utility in predicting response.

Biomarkers and biological agents (Nimotuzumab)

Recently a prospective study was conducted in oral cancer patients to study the effect of biomarkers on radiation response and prognosis. The biomarkers include EGFR, p53, Bcl2, Cyclin-D1 and p16. EGFR was seen in 78% of the patients and cyclin D1 in 70%. The presence of EGFR and p53 signified poor prognosis.

KMC, Manipal was one of the centers where the landmark Nimotuzumab trial on HNSCC was conducted. This open label, multi-centric, randomized phase IIb trial which recently published the 5-year survival analysis showed a 29% increase in overall survival (26% vs 57%, $p=0.03$) of Nimotuzumab along with concurrent chemo-radiotherapy as well as a trend to survival with radiotherapy alone in patients who cannot be offered chemotherapy (26% vs 39%, $p>0.05$).

The Future

Radiobiology studies will help us to march towards personalized medicine. If biomarkers predictive of radiation toxicity are identified chemo-radiotherapy can enter the personalized medicine revolution, allowing more aggressive treatment for less radiosensitive tumours and identifying those highly radiosensitive tumours for whom de-escalation can be safely done, thereby improving the therapeutic ratio.

The Future of radiobiology should include studies on Radiogenomics. About 5 to 10 percent of patients who receive radiation exhibit heightened sensitivity to conventional radiation doses. **“Radiogenomics is the study of the link between germ line genotypic variations and the large clinical variability observed in response to radiation therapy.”**

Single Nucleotide polymorphism (SNP) is the most common type of mutation where a DNA sequence variation is in one of the nucleotides. However as of 2014 – conflicting data exists for most SNPs or DNA-repair mutations. Hence, a RadioGenomics Consortium (RGC) has been setup by investigators at Christie Hospital, UK and Mt Sinai Medical School, NY which currently has 174 members from 90 institutions and is supported by NCI.

Recommendations for improving the scene of Clinical Radiobiology in India

- To actively involve radiation oncologists in teaching hospitals and major cancer centers in basic research.
- To get students of radiation oncology well acquainted with modern radiobiology.
- To encourage students and young radiation oncologists to do research in basic sciences.
- All students must have posting in radiobiology lab to understand various procedures.
- Radiobiology teaching should be actively incorporated in the training.
- AROI to conduct annual workshops of clinical radiobiology.
- Teaching hospitals and major cancer centers must have radiobiology labs to facilitate the above suggestions.
- Indian radiobiology labs to have sufficient funding to be competitive on an international level and join the Radiogenomics consortium.

“Life on Earth has developed with an ever present background of radiation. It is not something new, invented by the wit of man; radiation has always been there” – Eric. J. Hall.

This work is dedicated to all the students & staff of the dept of Radiotherapy & Oncology and Radiobiology (past and present) @ KMC, Manipal and Father Muller's Medical College, Mangalore.

Dr Vidyasagar M.S., Dr Prahlad.H.Y

“Workshop on Brachytherapy of Gastrointestinal Cancers”

The Department of Radiotherapy, Oncology Regional Cancer Centre and along with Indian Brachytherapy Society hosted a **“Workshop on Brachytherapy of Gastrointestinal Cancers”** at Postgraduate Institute of Medical Education and Research, Chandigarh on 7th-8th March, 2015. Brachytherapy is an established and integral part of treatment of cancers. Current advances in imaging and dosimetric evaluation can be exploited to further advance the discipline of Brachytherapy and use this unique treatment modality to benefit cancer patients. The technological advances of the present

era allow us to use Brachytherapy in a ever increasing number of indications including Gastrointestinal Cancers, which will be the focus of this workshop. The distinguished Radiation Oncologists from all over the country and abroad participated and interacted with the delegates. The prominent faculty of the workshop from abroad included .Prof. J.A.Polo Rubio from Ramon Y Cajal University Hospital, Madrid, Spain and Prof. R. Sur from McMaster University, Canada. For the first time in the region a live demonstration of interstitial implant was shown. Prof. R. Kapoor the organizing Secre-

tary of the Workshop performed a live demonstration of Brachytherapy in a case of Anal Canal Carcinoma with implantation of TLD chips in the tumour site for real time Dosimetry. Various Speakers dealt on the subject of Brachytherapy GI Cancers elaborately. Prof. S.C. Sharma Spoke about the evaluation of Brachytherapy in GI Cancers and Prof. GK. Rath apprised about the setting up of a comprehensive Brachytherapy facility. This Workshop was attended by over 150 delegates from India and abroad.

Dr. Rakesh Kapoor

6th Radiobiology CME's Conducted AT Kochi by Dr. Manoj Gupta

6th Radiobiology course was successfully conducted in Kochi on 11th January 2015 organised by Kerala Chapter under the Chairmanship of Prof C.S.Madhu. Around 80 students from Kerala, pondicherry, Chennai participated in the program. Some senior faculty also attended this course like Prof. T.K.Padmanabhan from Trivenderum, Prof Subhasini Jhons from Vellore, Dr Tom from Allepy, Prof Madhu to name a few. The course was highly appreciated by students and faculty both. The detail report will be sent by prof Madhu.

Oncology CME and Clinical Radiobiology Course was conducted at Hotel Gokulam Park, Kochi by the Cancer Research and Treatment Society under the chairmanship of Prof. C.S.Madhu (HOD Oncology, Lourdes Hospital, Kochi) to commemorate three renowned late oncologists Dr.Mrissa

Hussian, Prof.Thomas Cherian & Prof. F.Joseph respectively.

Prof. T.K.Padmanabhan Chief Guest, the retired professor of radiotherapy, Medical College, Thiruvananthapuram inaugurated the function by lighting the lamp.

The programme was well attended and appreciated by all. Dr.Anirdrudh Punnakal MD (Radiation Oncologist Max Superspecialty Hospital New Delhi) was awarded Dr.Mirza Hussain Memorial Oration for his lecture on "Looking beyond genomics-epigenomics and its applications in radiation oncology".

Dr.M.S.Belliappa MD (Radiation oncologist, HCG & Appolo Hospitals, Bangalore) was awarded Prof.Thomas Cherian Memorial Oration for his lecture on "Hypo fractionation – the way forward in Glioms".

One fullday course on Clinical Radiobiology

was done exceptionally well in memorial of Prof.F.Joseph single handedly by Dr.Manoj Kumar Gupta (Prof. of Radiotherapy, Indira Gandhi Medical College and RCC, Shimla.) on 11th January. More than 85 delegates attended the course and it was appreciated by one and all. A Radiobiology quiz was conducted following the course and Dr.Nabeel Ahammed (GMC, Kottayam) and Vishal Manik (GMC, Chennai) got the gold medals while Dr.Abhilash Aravindakhsan (GMC, Thrissur) and Dr.Bharath Gurram (AIMS, Kochi) received the silver and bronze medal respectively. The programme came to a close by 6 PM

Reports from Various conferences

Conference on Hypo-Fraction Kinjal

We have successfully organized a Conference on "Trends toward Hypo-fractionated Radiotherapy" as a part of JIC 2015 on 24th & 25th January 2015. There were total 150 delegates from across the country and 2 guest speakers from USA & Netherlands.

The meeting was focused on the role of Hypo-fractionation in management of various cancers. The meeting began with Physics & Radiobiology of Hypo fractionation. In CNS tumors the role of SRS & SRT is well proven. For the early stage lung cancer, SABR / SBRT is one of the most promising modality for cure. 4D CT scan helps in delineating the target better and accurate treatment delivery. Prostate also is one of the organs where SBRT is used in increasing manner. Solitary or Oligo Liver metastases can be treated with SBRT. Role of hypo-fractionation in Breast tumors is also increasing with the help of brachytherapy, Accelerated Partial Breast Irradiation (APBI) and short course schedules without major toxicities. In recurrent H & N tumors SBRT can be used effectively. In Gynec tumors, Pancreas, GI tumors still the role of hypo-fractionation is not proven and trials are going on for recurrent tumors.

Yashoda International Cancer Conference Srinivas C

Yashoda Super-speciality hospital successfully conducted 1st Yashoda International Cancer Conference at Hyderabad International Convention centre on **Feb 23-25th 2015**. It was attended by more than 1000 delegates including 200 oncologists and physicians from various allied specialties like ENT Surgery, General Surgery, gastroenterology and gynaecology. On **Feb 23rd**, Yashoda Radiation Oncology Practicum was held at the same venue with select 45 delegates. For the first time in India, the workshop engaged each of these delegates with Eclipse workstations, simulating the clinical work at their home centres. The theme of the practicum and the conference was Head Neck, Gastro-intestinal, gynaecological and breast cancer. Renowned faculty from India and world participated in this event and discussed various controversies and latest evidence in these fields. Panel discussions and debates were specially appreciated by the audience and brought out useful take home messages.

6th Cancer CI

The 6th Cancer CI and 2nd Apollo cancer conclave was held from Feb 6th to Feb 8th '2015 at HICC, Hyderabad. It was one

of the largest cancer gatherings held in the country with over 3000 registrations and 30 international faculties.

The conference kicked off with the pre-conference workshops on 5th of Feb'2015. There were three simultaneous workshops



being conducted for the different branches of oncology. There was a robotic surgery workshop and bone marrow transplant workshop being held at Apollo Hospitals, Jubilee Hills, Hyderabad along with a hypo-fractionation workshop for radiation oncol-



Reports

ogists at HICC, Hyderabad. All the workshops had full attendance and were well appreciated.

Each session was concluded with an interactive panel/case discussion with the audience response included so as to reach a consensus on the management of different cancers in various scenarios.

60 posters presented by PG students from all over the country. Out of these, three students were finally judged to be the winners.

Any conference or conclave like this is not possible with the support of the pharmacological companies. There was varied number of stalls put up throughout the duration of the conference.

The inaugural function of the conference was held on the night of 6th of Feb with Dr.P.C Reddy as the Chief Guest along with the Hon'ble Health Minister of Uganda. Their presence and support signified the magnitude of this event. The banquet dinner was held on the night of 7th of Feb at HICC by CURE foundation with the theme of the event being, "Dance Like a Child". It consisted of inspiring dances by the children cancer survivors and a scintillating performance by Dr.Mahesh Joshi for the rest of the evening.

The 6th Cancer CI and 2nd Apollo Cancer Conclave was a conference which consisted a little bit of everything, a brilliant scientific program, enthusiastic doctors sharing their knowledge from all over the world and the entertaining evenings with a cause!!



Congrats to all individuals, teams and sponsors for making the events successful.

Modern era radiotherapy making differences in life

Today radiotherapy is being given more efficiently, more precisely and in less time with the help of incremental and disruptive innovations in engineering, medicine and computational sciences.

Key areas where new technologies are making the difference are computer assisted treatment planning systems (auto segmentation, autocontouring, better algorithms and improved hardware), continuous imaging for interfraction and intrafractional motion management, higher geometrical precision with the help of robotics, higher dose rates for techniques like VMAT to deliver radiation doses in shorter times, gating of the beams to manage moving targets, stereotactic radiotherapy and hypofractionated radiotherapy.

But to make best use of these techniques and machines delivering the same requires more continuous educational programs, theme based workshops and seminars with a zest for learning and adaption among the radiotherapy fraternity. Let us workout together the roadmap to make best use of the opportunity that makes the difference in lives of people whom we treat.

Deepak Arora, CMP



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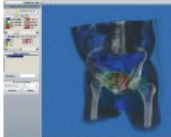
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Young radiation Oncologists Conference held in Bhubaneswar—a report

There is paradigm shift from four line radiotherapy to a four dimensional radiotherapy in last one decade. Despite all limitation, the young radiation oncologists are delivering evidence based treatment to their patients. In high precision radiotherapy, it is not only the machine but also the man behind it is important to deliver the proper treatment.

YROC (Young Radiation Oncologist Conference) - 2015 was an attempt to bring together the young and bright radiation oncologist on a single platform, in order to facilitate interaction, co-operation and exchange of knowledge to improve outcome and ensure homogeneity of treatment practice throughout the country.

The conference was held in Bhubaneswar during 10-11 January 2015 and it was organized by Hemalata Hospitals and Research Centre, Bhubaneswar in association with AROI, Odisha chapter. The theme of the conference was "Current Radiotherapy treatment protocols -Indian context". More than 150 Radiation Oncologists from various corners of the country attended in this conference. The entire conference was packaged with scientific presentations, panel discussion and poster presentation.

Radiotherapy in the era of conformal therapy requires precision. Contouring forms the basis of precision. Success of IMRT and IGRT depends totally on the ability to precisely define the target, and delineation of organs at risk. E-contouring with multimodality imaging and allied tools is the key to this success. Contouring however requires learning and expertise. To reduce heterogeneity of contouring protocols, it is important to learn contouring with logical and scientific basis. Early adoption of these techniques will help Young Radiation Oncologists to gain practical experience with the-



se newer radiotherapy techniques. For this a pre-conference workshop on e-contouring was held on 9 January 2015, where the Young oncologists enjoyed the event through Learn, Share & Grow mindsets. Contouring workshop was on Head & Neck & Pelvic malignancy.

The topic covered during the conference were Neuro oncology, Head & neck Cancer, Medical Physics, Breast Cancer, Thoracic Cancer, Gynaec & Genitourinary cancer, Pediatric Oncology, Gastro Intestinal Cancer, Brachytherapy and Radiobiology. In each session there were 2-3 Guest Lectures by the Young Oncologists followed by Research paper presentations by the students from different medical institutes.

The first session, was on Neuro oncology & there were Guest Lectures on radiotherapy & glioma & paper presentations by the post graduates & also there was a case based panel discussion on re-irradiation in brain tumor. Accordingly all the site specific topics were covered & in each session there was a best paper award, which was selected by the chair person, & a best paper poster award, which were as follows.

Best Oral Presentation

Neuro Oncology: Dr. Tandra Divya, Omega Hospital, Hyderabad

Head & Neck: Dr. Shasank Srinivasan, Puspanjali Crosslay Hospital, Ghaziabad

Medical Physics: Dr. Damodar Kumaran, AIIMS, New Delhi

Breast Cancer & Thoracic Tumor: Dr. Chandralekha Krishnan, Christian Medical College, Vellore

Miscellaneous: Dr. Krishna Amulya Koti, Christian Medical College, Vellore

Gynacc & Gentito Urinary Cancer: Dr.



Jayashree Kuna, SVIMS, Tirupati, AP

Pediatric Oncology: Dr. Rohit Kabre, GMCH, Nagpur

Gastro Intestinal Cancer: Dr. Pankaj Kumar. Max Super Speciality Hospital, Zirahpur, Punjab

Brachytherapy: Dr. B. Srinivas Rao &

In Poster presentation

First: Dr. Suparna Kanti Pal, I.P.G.M.E & R, Kolkata, West Bengal

Second: Dr. Shruti Agarwal, JKCI GSVM, Kanpur, UP

OBITUARY



Dr. Tarit Kanti Dutta was born in February, 1941 in East Bengal. He did MD (Radiology) from AIIMS, New Delhi in 1971.

He joined PGI, Chandigarh as Registrar in Radiotherapy in 1971 and simultaneously did M.D. (Radiotherapy). After MD, he continued as Lecturer in 1974 and rose to

the level of Assistant Professor.

In November 1979 he left for USA as a visiting fellow to join Allegheny General Hospital, Pittsburgh under Dr. Joseph Concanon.

He is the initiator and founder of AROI in 1977 along with few others like Prof A D Singh, Prof Mihir Mitter, Dr. Kulkarni and was the first general secretary of the association. In the short span of 8 years at

PGI, Chandigarh he established himself as a very good teacher, very strict practitioner of Radiotherapy.

He was kind hearted, helped others in need and a voracious reader. He was a friend, philosopher and guide to all of us.

Dr TK Dutta passed away in USA on 30th January 2015

Forthcoming Events 2015

National

April, 2015

18-19 ICRO Teaching Program

Shri Ram Murti Smarak Institute of Medical Sciences, Bareilly-243202

Dr. Piyush Kumar Agrawal piykumagr@gmail.com

May, 2015

2-3 Best of ASTRO India

Kokilaben Dhirubhai Ambani Hospital Auditorium, Mumbai, India.

Contact person : Kaustav Talapatra Email: kaustee@gmail.com

Aug, 2015

29-30 Annual Conference of Indian Brachytherapy Society (IBSCON 2015)

Department of Radiotherapy, Apollo Gleneagles Hospital, Kolkata

Contact Person: Dr. Subrata Saha, Organizing Secretary

Email: saha1958@yahoo.co.uk

Nov 2015

20-22 APMICON-2015

Division of Radiation Physics, RCC, , Thiruvananthapuram

Contact person: Saju Bhasi Email: ampicon2015@gmail.com

26-29 AROICON15, Lucknow

Asstt.Prof. Sudhir Singh ,Organizing Secretary

Email: aroicon2015@gmail.com

Dec 2015

ARO-ESTRO

Max Superspeciality Hospital, Saket

Contact person Dr. A. K. Anand Email: anandka.55@gmail.com

International

May 2015

First Council Meeting of FARO

Kyoto International Conference Center, Japan

Contact person: Tomoaki Tamaki, Deputy Secretary General of FARO

Email: tamakita@saitama-med.ac.jp



**Look out for
ARO fellowships
announcements
in the next issue**

ARO Steering Committees become active

Dear Friends,

As per discussion in GBM held on 8th Nov 2014, at Imphal during 36th AROICON to streamline activities of AROI. According to decision of GBM we have made few committees, these are:

1) Constitution review committee:

Chairman: Dr. K. T. Bhowmik

Email: bhowkt@gmail.com

2) Committee to modify/review the syllabus of M.D. Radiotherapy:

Chairman: Dr. P.K. Julka

Email: pkjulka18@hotmail.com

3) Coordination with AERB:

Chairman: Dr. Shyam Shrivastava

Email: shyamshrivastava@gmail.com

4) PAproblems with Vendors:

Chairman: Dr. Shelly Hukku

Email: hukkus@yahoo.co.in

5) D.M. Medical Oncology Entrance Criteria:

Chairman: Dr. Uday Shahi

Email: shahiuday@gmail.com

6) Change of Name of M.D. Radiotherapy degree:

Chairman: Dr. M. C. Pant

Email: drmc pant1956@gmail.com

You can give your suggestions in further improvement of AROI activities. If there are suggestions, queries or support needed from committees, you can send email Chairman's of respective committees with copy of same to me.

Dr. Rajesh Vashistha
General secretary

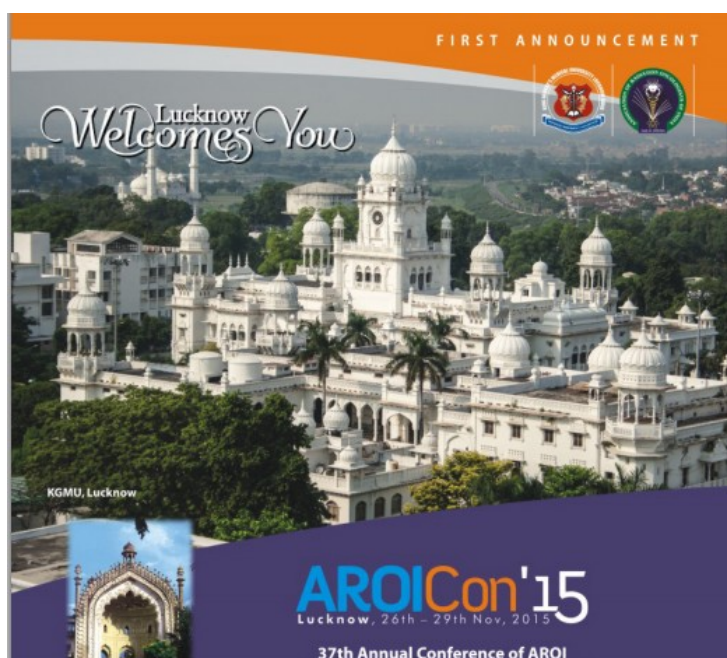
Dr. Arun Chougale successfully hosted ICMPRPR2K15 at Jaipur under aegis of AMPI_NC



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Response to last issue question

Publication and citation of India based Radiation Oncology research in Global scenario, have we made our mark?

Verbatim response to this question has been that citation of Indian research has been sporadic and far between. Reasons cited are over worked clinical departments, poor infrastructure, poor research temperament and low interest in academic activities in private institutes. However despite that brilliant works have been carried out by Radiation Oncology community.

Question of this issue

What can be done further to improve learning aptitude in Radiation Oncology community ?

Please send your reply for publication in next issue of AROI newsletter to deepak.arora3@maxhealthcare.com

We wish to initiate small articles on tech facts, tech tips, tit-bits with your input. Please send your entries. - Editorial Board