



CAPE NEWS

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Inside this Issue

1. Experience with the insulin pump.
Ganesh Jewalikar
2. President's Message
3. ISPAE 2011: Progress report
4. Members' Publications
5. Journal Spice: J Muthukrishnan
6. More ISPAE News: New Members, Kannur & T'puram meetings, C'wealth fellowship, Awards, Charity activities,
6. Forthcoming Meetings, Letters

ELECTION NOTICE

Notice is hereby given for ISPAE Elections 2010. Dr Anju Virmani, Returning Officer, will email you shortly with details.

MY EXPERIENCES WITH INSULIN PUMPS: A NOVICE'S VIEW

Ganesh Jewalikar, g_jewlikar@yahoo.co.in.

Introduction

Continuous subcutaneous infusion of insulin (CSII) with an insulin pump is the most recent advance in the insulin delivery systems. Being the most physiologic mode of administration, it is becoming increasingly popular amongst physicians caring for diabetic patients. But like any treatment modality, it has its own advantages and disadvantages. When used unwisely, it may not give poor results and sometimes even cause worsening of diabetic control.

The cost factor

At present, a major hindrance to the pump therapy is the high cost, particularly since most patients do not have health cost reimbursement, and the pump cost and consumables is not covered under insurance. The initial cost of pump varies from Rs 1.2 to 3.5 lakhs, depending on the model, while the consumables cost Rs 4,000- 5,000 per month. The cost of insulin and strips for blood glucose is of course additional (but that would be a cost even without the pump).

Patients who cannot afford pump therapy should be reassured that at least in the present state, they are

Contd on page 5



ISPAE WEBSITE

Have you seen our website?
www.ispae.org.in.

PEDICON 2011: 48th Annual Conference of IAP: Jaipur, Rajasthan: 19-23 Jan 2011.
Organizing Secy: Tarun Patni.
www.pedicon2011.com

ISPAE 2011: Calicut, Kerala: 25-27 Nov, 2011.

ISPAE-PET 2011 (Pediatric Endocrine Training program): Calicut 22-25 Nov 2011.

Organizing Secy:

Vijayakumar M. email:

vijayakumarmdr@yahoo.com. For more details, see website.

PRESIDENT'S MESSAGE

Dear members,

I am happy to inform you about some of the new developments in our Society's activities.

Nominations were invited from our Society members to become active members of the Global Pediatric Endocrinology and Diabetes (GPED). Eleven of our members sent their nominations for the same. GPED's mission statement is to improve the care of children and adolescents with endocrine disorders in developing countries through the provision of training and educational opportunities, collaborative research studies and promoting advocacy for our goals. Towards this objective the first meeting

Abstract: Aromatase inhibitors [AI] have been increasingly used in boys with growth retardation to prolong the duration of growth and increase final height. Multiple important roles of estrogen in males point to potential adverse effects of this strategy. Although the deleterious effects of aromatase deficiency in early childhood and adulthood are well documented, there is limited information about the potential long-term adverse effects of peripubertal aromatase inhibition. To address this issue we evaluated short and long term effects of peripubertal aromatase inhibition in an animal model. Peripubertal male Wistar rats were treated with AI letrozole or placebo and followed until adulthood. Letrozole treatment caused sustained reduction in bone strength and alteration in skeletal geometry, lowering of insulin like growth factor I levels, inhibition of growth resulting in significantly lower weight and length of treated animals and development of focal prostatic hyperplasia. Our observation of adverse long-term effects after peripubertal male rats were exposed to aromatase inhibitors highlights the need for further characterization of long term adverse effects of AIs in peripubertal boys before further widespread use is accepted. Furthermore, this suggests the need to develop more selective estrogen inhibition strategies in order to inhibit estrogen action on the growth plate whilst beneficial effects in other tissues are preserved.

This study was conducted in the light of increasing off label use of AIs in short boys. We hypothesized that given the significant physiological role of estrogen in males, AIs will have significant adverse effects in this setting. Our study unequivocally showed long term adverse effects on skeletal and reproductive health of letrozole treatment in peripubertal male rats. The study raises key safety concerns and need for utmost caution in the use of AIs for this indication. As a follow-up of this study we are planning to delineate the role of individual estrogen receptor involved in mediating these adverse effects. In our follow-up study we plan to use subtype specific estrogen receptor agonists and antagonists, with the aim of developing selective estrogen inhibition strategies so as to preserve the effects on growth plate while avoiding other untoward effects.

Bhakhri BK, Debata PK. Nutritional rickets presenting with myelofibrosis. Indian J Pediatr 2010: accepted for publication.

A 10 mo old breastfed infant with rickets and associated myelofibrosis presented with anemia & hepatosplenomegaly. On therapeutic vitamin D supplementation, there was reduction in liver &

spleen size along with improvement in rickets, anemia, growth and developmental parameters.

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Kulshreshtha B, Eunice M, Ammini AC. Response to GH Therapy in Adolescents with Familial Panhypopituitarism. Indian Pediatr 2010; 47: 356-8

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Rustagi VT, Khadilkar VV, Khadilkar AV, Jahagirdar R, Lalwani S. Right atrial thrombus in a six- year- old Indian boy with metabolic syndrome. J Pediatr Endocrinol Metab. 2010 Jun;23(6):553-4

JOURNAL SCAN

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Insulin sensitivity and lipid profiles in girls with central precocious puberty (CPP) before and during gonadal

suppression K Sørensen, A Mouritsen, SS Mogensen, L Aksglaede, A Juul. *JCEM* 2010; 95:3736-3744.

Early menarcheal age is associated with increased cardiovascular morbidity and mortality in adulthood. Greater adiposity with early pubertal onset was the only mechanism proposed for this defect. Greater degree of adiposity is noted in girls with CPP and early normal puberty, compared to girls with normally timed puberty. Also, obese girls are known to have early pubertal onset and menarche. Hence, there appears to be a two way relationship between pubertal timing and adiposity. The presence of adverse metabolic risk factors is not known in girls who experience early normal puberty (EP) cf. CPP, and the role of increased adiposity contributing to these adverse risk factors is not clear. The authors in this well designed study evaluated 23 girls with EP or CPP and 115 controls with normal pubertal timing for insulin sensitivity, body composition and serum chemistry for glucose and lipids. At diagnosis of CPP, girls had higher fasting insulin, triglyceride, and low density lipoprotein-cholesterol levels as well as lower insulin sensitivity and high-density lipoprotein/ total cholesterol ratios compared with controls after adjustment for pubertal stage and body fat percentage. Age at pubertal onset positively predicted insulin sensitivity for a given pubertal stage. One year follow up during GnRHa treatment of these girls showed that insulin sensitivity decreased even further and total body fat percentage increased despite complete gonadal suppression.

The authors concluded that the lower insulin sensitivity in girls with CPP was not solely accounted for by the concomitantly higher adiposity compared with puberty matched controls. GnRHa treatment lowers sex steroids but may not influence upstream neural networks responsible for the coordination of the reproductive and metabolic aspects of pubertal maturation. In this respect, hypothalamic neurons expressing neuropeptide Y and kisspeptin are both critically involved in central modulation of GnRH secretion as well as modulation of adiposity and glucose homeostasis in response to peripheral metabolic clues such as insulin and leptin. Thus, insulin sensitivity may play a central and independent role in the relationship between early pubertal timing and adverse metabolic risk. Increasing insulin sensitivity and thereby lowering insulin and leptin levels may prove beneficial as an adjuvant to GnRHa treatment in girls with CPP. This hypothesis requires further larger studies.

Risk of corrected QT (QTc) interval prolongation after pamidronate infusion in children. A Rothenbuhler, I Marchand, P Bougneres, A Linglart. *JCEM* 2010; 95; 3768–3770.

Hypocalcemia causes prolongation of QTc interval which leads to increased risk of cardiac conduction defects and death. Pamidronate, which is routinely used in children for the treatment of osteogenesis imperfecta, causes

hypocalcemia which spontaneously gets corrected by physiological compensation. The authors in this small study of clinical relevance, proposed to study children treated with pamidronate for cardiac conduction defects. Thirty-four children with cerebral palsy and severe osteoporosis were treated for approximately 1 yr with pamidronate (three times per year). Serum calcium and QTc interval were measured before and 24h after each cycle of intravenous infusions. All patients received calcium and vitamin D supplementation and were vitamin D sufficient prior to treatment (mean serum 25 OH-D 37 ng/ml). Pamidronate infusion decreased significantly the serum calcium level in all children from a median of 2.40 mM to 2.21 mM. Calcemia decreased in 92% of the pamidronate infusions and fell below the normal range (2.25–2.60) in 65%. After pamidronate, median QTc increased from 390 ms [378–391] to 403 ms [400–413] ($P < 0.0001$), with a median increase of 20 ms [16–28]. QTc at baseline was significantly correlated to final QTc. Because the nadir of calcemia after pamidronate is expected to occur 3–4 days after the pamidronate infusion, this study may have underestimated both the decrease in calcemia and the lengthening of the QTc. Among known factors that affect ventricular repolarization, such as hypokalemia, hypomagnesemia, bradycardia, or specific drugs, the more occult and risky may be the genomic variants in genes coding for ion channels that have been associated with constitutive prolonged of QT and the increased risk of sudden death. Thus, the authors propose that, before administration of pamidronate, factors influencing calcium levels (such as vitamin D deficiency), or QTc (including antiemetic and antibiotic treatments), should be looked for. In addition, a systematic measurement of the basal and post-infusion QTc should become a mandatory prerequisite before pamidronate treatment. In cases of prolonged QTc before and/or after pamidronate infusion, attempts should be made to raise serum calcium levels to the upper part of the normal range.

Diagnostic Re-evaluation of Children with Congenital Hypothyroidism. Nair PS, Sobhakumar S, Kailas L. SAT Hospital, Thiruvananthapuram. *Ind Pediatr* 1 2010 Jan 15. [E-Pub ahead of print]

Summary: This was a hospital based observational study from SAT Hospital, Thiruvananthapuram, in which causes of congenital hypothyroidism (CH) were investigated in children age $>3y$, frequency of transient *vs* permanent hypothyroidism documented. Among 36 children studied (20 boys and 16 girls), 50% had transient hypothyroidism. In the remaining half with permanent CH, 15 (41.7%) had thyroid agenesis; one each had hemiagenesis, ectopic thyroid and dysmorphogenesis. The authors concluded that thyroid hormone supplementation could be discontinued in half the children diagnosed with CH.



This study highlighted the need for re-evaluation of all babies with CH, as they found that half their group had transient CH, and would have continued to be treated unnecessarily. Studies from other parts of the world have reported transient hypothyroidism in 1-50% of children with CH. The need for thyroid imaging with ultrasound and/ or radionuclide scan also emerges from this study. Finding of agenesis, hemiagenesis, or ectopia would suggest permanent CH. –Ed.

EXPERIENCES WITH INSULIN PUMPS...

Contd from page 1

... not at a serious disadvantage, because equally good control can be achieved with *basal bolus* therapy.

What do experts say?¹

The decision to start pump therapy should be jointly made by the child, parents and diabetes team. While all patients with type 1 diabetes may be potential candidates for pump therapy, CSII (continuous subcutaneous insulin infusion) should be particularly considered in following circumstances:

1. Recurrent severe hypoglycemia
2. Wide fluctuations in blood glucose (BG) levels, regardless of A1c levels
3. Suboptimal diabetes control (i.e., A1C exceeds target range for age)
4. Microvascular complications and/or risk factors for macrovascular complications
5. Good metabolic control but with an insulin regimen that compromises lifestyle

Other circumstances in which CSII may be beneficial:

1. Adolescents with eating disorders
2. Children and adolescents with a pronounced dawn phenomenon
3. Pregnant adolescents, ideally preconception
4. Ketosis-prone individuals
5. Competitive athletes

Initiation of CSII requires a diabetes team experienced in managing children on pump therapy and a motivated and intelligent patient and family who is in regular touch with the diabetes team. Children/caregivers should have basic knowledge about diabetes including hypoglycemia, diabetic ketoacidosis, sick day management, carbohydrate counting, etc and they should receive initial and ongoing education about pump therapy.

Personal experience with insulin pumps

Amongst the diabetic patients or parents that I encountered in the past two years of my career in Endocrinology, very few (approximately less than 2-

3%) asked about pump therapy on their own. Many parents confused the pump with the nasal spray of Insulin and were less enthusiastic about it when they knew what it actually was! Others were discouraged by the high cost. Of the patients who could afford them, some (especially adolescent girls) refused because they did not want a reminder of their diabetes round the clock.

Of the ten patients that I observed over the past year, I got a mixture of good and bad experiences.

Advantages

1. Most important: having separate basal rates for different times of the day, and the setting up of temporary basal rates for stress, exams, exercise etc.
2. Also important: decrease in the number of pricks for taking insulin injections, and
3. Relative freedom of the meal and snack timings and frequency without increasing the number of pricks.

The number of patients was too small to make any opinions about improvement in A1c or frequency of hypoglycemia.

Generally the patients who performed reasonably well were those with a sound basic knowledge of diabetes management. They were monitoring their blood glucose regularly and were maintaining a log. They were practicing carbohydrate counting to decide their bolus doses.

Disadvantages

1. At least two patients had poor A1c's on pump therapy. Both had nearly abandoned BG testing and were not taking appropriate bolus doses.
2. Many patients (especially adolescent and young adult males) were using a very limited area of the abdomen for the injection site and were not comfortable with other sites due to various reasons.
3. Some parents and patients abuse the freedom of having snacks by eating liberally and land up in poor BG control due to excess snacking.

4. Infrequent or no boluses for snacks defeats the purpose of the pump and may lead to poor glycemic control.

Role of Continuous Glucose Monitoring System

I observed that a 72 hour profile of continuous glucose monitoring (CGM) with a BG log was a very useful adjunct to CSII. These 3 days should preferably include working days as well as holidays. This identifies patterns of glycemic control and the dosage adjustment or dietary adjustment becomes much easier to advise. In adults, CGM has been shown to be associated with improved glycemic control².

Key messages

1. Pump therapy should be started only by endocrinologists who are well versed with dealing with type 1 diabetes, preferably with the complete support of a diabetes team.
2. Patients advised to initiate pump therapy should be carefully selected: they should be able to afford the expenses, already testing BG frequently and able to make dose adjustments, motivated to control diabetes better, compliant with follow up, and knowledgeable about practical home management of diabetes.
3. The advantages and disadvantages of the therapy should be fully discussed, and rational expectations kept.
4. While the technical expertise of the representatives of the pump manufacturers cannot be ignored, clinical decision making about insulin dosage should be done by the physicians and patients, with representatives providing only a supportive role.
5. CGMS is an important adjunct to pump therapy.

References

1. Phillip M, Battelino T, Rodriguez H, Danne T, Kaufman F; European Society for Pediatric Endocrinology; Lawson Wilkins Pediatric Endocrine Society; International Society for Pediatric and Adolescent Diabetes; American Diabetes Association; European Association for the Study of Diabetes. Use of insulin pump therapy in the pediatric age-group: consensus statement from the ESPE, LWPES & ISPAD, endorsed by ADA and EASD. *Diabetes Care*. 2007 Jun;30:1653-62.

2. Juvenile Diabetes Research Foundation Continuous Glucose Monitoring Study Group. Continuous glucose monitoring and intensive treatment of type 1 diabetes. *NEJM* 2008 Oct 2;359:1464-76.

MORE ISPAE NEWS KANNUR MEETING

Reetha Gopinath, pulikkambeth74@yahoo.com



A CME on Pediatric Endocrinology was organized by Indian Academy of Pediatrics (IAP) Pariyaram branch, at Pariyaram Medical College, Kannur, Kerala on 11 July 2010, It was held in connection with the inauguration of the Pediatric Endocrinology Clinic in the hospital.

THIRUVANANTHAPURAM MEETING

Lalitha Kailas, HOD, Pediatrics & Santhosh Kumar, President, IAP, Thiruvananthapuram

The Department of Pediatrics, Medical College, Thiruvananthapuram; IAP Thiruvananthapuram; and the Pediatric & Adolescent Endocrinology Chapter of IAP jointly organized a CME on 3rd August 2010 at Omana Mathew Hall, SAT Hospital, Medical College, Trivandrum. The speaker was Dr Ram Menon, Prof of Pediatrics & Pediatric Endocrinology, Univ of Michigan, USA.

Dr Lalitha Kailas, Prof. & HOD, Dept of Pediatrics, introduced Dr Menon and warmly welcomed the delegates. Dr Menon spoke on the various aspects of Ambiguous Genitalia, including clinical presentation, diagnostic algorithm, and management issues, emphasizing the need of a dedicated team for effective and sustainable management of this complex problem. Dr Shobhakumar, Assoc Prof in charge of the Endocrinology Clinic, proposed the vote of thanks. All of us in the department would like to express our immense gratitude to Dr Menon for his excellent lecture and Dr V Bhatia for arranging



this academic feast.

COMMONWEALTH FELLOWSHIP

Dinesh Dhanwal, Delhi, dineshdhanwal@hotmail.com

I joined the Commonwealth Commission Academic Fellowship on 3rd October 2009 with Prof Cooper at MRC, Southampton University, Southampton with an objective to learn methodology to carry out epidemiological studies in the field of osteoporosis in India. The aim of this fellowship was to create protocols for hip fracture incidence and case controls for hip fracture in India so that data can be generated, to have a say in making policies for osteoporosis and related diseases in the Indian context. During my stay I was focused on fulfilling these objectives. A synopsis of it is as follows:

I attended the following symposia/conferences to update my knowledge:

- Epidemiology for Clinicians: Cambridge, UK; 6-8 Jan 2010. This was a three day course on my subject conducted by the National Faculty at Jesus College, Cambridge. The course involved practical and problem solving training as well. **CSC funded this.**
- Clinical Osteoporosis: San Antonio, Texas, USA; 10-13 Mar 2010. This was an international symposium on osteoporosis, with hands-on training on DXA. **Prof Cooper funded this conference as part of my training.**
- Weekly seminars in Rheumatology Department, presented by faculty members of Rheumatology.
- Weekly seminars in Endocrinology.
- Reading books/journals on epidemiology of osteoporosis. **Prof Cooper was kind enough to provide funds from MRC to buy books.**

I attended the Osteoporosis Clinic and Bone Densitometry Centre to learn about the care of these patients and newer techniques in DXA scanning.

I worked on the following manuscripts (submitted or under submission):

- Maternal plasma long chain polyunsaturated fatty acids determine bone health in their children at age of four: Southampton Women's Survey.
- Respiratory functions associated with bone mineral density? Results from Hertfordshire Study.

- Epidemiology of osteoporosis: worldwide geographic variations.
- Geographic variation in osteoporotic hip fracture incidence: the growing importance of Asian influences in coming decades.
- BMD in vitamin D deficient and sufficient patients with hyperthyroidism.
- Reversal of bone loss in hyperthyroidism after medical therapy.
- Hypothalamic pituitary dysfunction in TB meningitis.

I created the following protocols for India specific studies:

- Hip fracture incidence study**; some pilot work already done at Medical College, Rohtak, India where this study will be carried out. This study will contribute to world literature about hip fracture incidence rates from India.
- Hip fracture in India**: a case control study; this study will evaluate the risk factors for hip fracture in India. This study will involve 500 cases of hip fracture at Maulana Azad Medical College, New Delhi, and 1-2 more centers.
- Study of sarcopenia using handgrip strength** in hip fracture patients in India. Prof Cooper was kind enough to provide Jamar hand held dynamometer from MRC funds for this study.

I actively participated in National Hip Fracture Database at Southampton General Hospital and attended rounds to learn patient care for hip fracture patients in UK. There were very few patients from South Asia (<10) in Southampton General Hospital, so differences in ethnicity in hip fracture could not be compared.

Others:

- Basic online course on statistics: Introductory Statistics with STATA.
- Visited Oxford University where Prof Cooper is Chair of Epidemiology of Rheumatological diseases.
- Attended endocrine, gestational diabetes, diabetes clinics in the Department of Endocrinology.

Finally I have established links with Prof Cooper and his team at MRC for long term collaboration in research in India in the field of Epidemiology of Osteoporosis. The starting point will be the incidence of hip fractures in India and case control study of hip fracture in India.

CONGRATULATIONS!

At the recently concluded ISBMR 2010 (13-14 August), our member **Dr Shivaprasad** won the '**Bone Health Award**' Runner up prize (Rs.50000) for a paper on "Sex specific reference data for bone density parameters measured with dual energy x-ray absorptiometry in a large cohort of healthy Indian children and adolescents." He also won the **Best Oral Paper Award** for a paper on "Correlation between BMD measured by peripheral and central DXA in healthy Indian children and adolescents aged 10-18 years."

CHARITY ACTIVITIES

ISPAE is mandated to conduct some charity activities through its members, apart from educational activities. It has been supporting our member, Dr Sahul Bharti, in his selfless work in Himachal Pradesh.



Subsidized insulin and glucose test strips have also been provided to poor children with diabetes by Dr V Bhatia and by Dr A Virmani, using donations made to ISPAE by patients. In addition, oral Vitamin D (Arachitol) was given to underprivileged children and adolescents with thalassemia in Faridabad, Haryana.

We welcome other members to similarly let us know of their charitable activities, and if possible route them thru ISPAE.

FORTHCOMING MEETINGS

1. **ISPAD 2010:** 35th Annual Meeting of the International Society for Pediatric & Adolescent Diabetes: Buenos Aires, Argentina: 5-11 Sep 2010. Contact: Olga Ramos, ramoso@interlink.com.ar.
2. **ESPE 2010:** 49th Annual Meeting of the European Society of Pediatric Endocrinology: Prague, Czech Republic: 22-25 Sep 2010. www.espe2010.org
3. **APPES 2010:** Fellows' Meeting immediately preceding APPES 2010: Xi'an, China: 13-17 Nov 2010.
4. **APPES 2010:** Biennial meeting of Asia Pacific Pediatric Endocrine Society: Xi'an, China: 17 -20 Nov 2010. Details: www.appes2010.org.
5. 4th International Congress on **Prediabetes and Metabolic Syndrome:** Madrid, Spain: 6-9 April, 2011. www.kenes.com/prediabetes.
6. **Endocrine Society (USA)** 2010: San Diego, 19-22 June, 2010.

7. **ESI 2010:** Annual Meeting of the Endocrine Society of India: Christian Medical College, Vellore: 9-11 Dec 2010. Contact: Nihal Thomas, nihal_thomas@yahoo.com; Website: esicon2010.com
8. **PEDICON 2011:** 48th Annual Meeting of IAP: Jaipur: 19-23 Jan 2011. Contact Tarun Patni, www.pedicon2011.com
9. **Endocrine Society (USA)** 2011: Boston, Mass, 4-7 June, 2011.
10. **ESPE 2011:** 50th ESPE Meeting: Glasgow, Scotland: 25-28 Sep, 2011. <http://www.eurospe.org/meetings/>; www.eurospe.org
11. **EASD 2011:** 47th Annual meeting: Lisbon, Portugal: 12-16 Sep, 2011.
12. **ISPAD 2011:** 36th Annual Meeting: Miami, USA: 19-22 Oct 2011. Contact Dr Alan Delamater, ADelamater@med.miami.edu
13. **PET 2011:** Pediatric Endocrine Training Program: Calicut, Kerala: 22-25 Nov 2011. Contact: M Vijayakumar, vijayakumarmdr@yahoo.com
14. **ISPAE 2011:** 2nd Biennial Meeting: Calicut, Kerala: 25-27 Nov 2011. Contact: M Vijayakumar, vijayakumarmdr@yahoo.com
15. **ESI 2011:** Pune (dates not fixed).
16. **ESPE 2012:** 51st ESPE Meeting: Leipzig, Germany: 20-23 Sep, 2011.
17. **ESPE-LWPES:** 9th Joint ESPE/ LWPES Meeting: Rome, Italy: 18-21 Sep, 2011.

LETTERS/ NEWS YOU CAN USE



Orchidometers (see picture above) and **Growth Charts** based on Agarwal data, can be purchased from ISPAE. Contact Dr V Bhatia, vbhatia@sqqgi.ac.in. The orchidometer costs Rs 1000 for members, Rs 1200 for non-members, and Rs 1500 for organizations (the Holtain orchidometers cost about Rs 7000). The growth charts cost Rs 50 for 100 sheets.

RSSDI 2010: CALL FOR ABSTRACTS

The RSSDI 2010 Annual Conference is being held in Cochin from 18-20 Nov 2010. The Scientific Committee requests members to send abstracts for oral presentations and poster presentations: the last date is 30th Sep. Please send the abstracts to draravind@hotmail.com. Or by post to: Dr SR Aravind, Chairman Scientific Committee, c/o DIACON HOSPITAL, 360, 19th Main, 1st Block, Rajajinagar, Bangalore 560010. Briefly mention the Title, Aim of the study, Methodology & Results.

Ninth Winter Symposium of CMC, Vellore On "Biology of Childhood Disease": Jan 6- 8, 2011

Meeting will cover various topics in Pediatrics, including Pediatric Endocrinology: for undergraduates, postgraduates and pediatricians interested in clinical and basic science research. Contact: Dr. K. Anil Kuruvilla, Organizing Secretary, Dept of Child Health, CMC Hospital, Vellore – 632 004, Tamil Nadu, Ph: 91-416-2283311/ Fax: 91-416-2232103/ 2232035. e-mail: anilkk@cmcvellore.ac.in; information@cmcwintersymposium2011.com. Website: www.cmcwintersymposium2011.com.

