



The Arvid Wretling Lecture: advances in fat digestion

The 23rd ESPEN Congress Arvid Wretling lecture 'Molecular and physicochemical aspects of fat digestion' was given by Professor O. Hernell, Professor of Paediatrics, Department of Clinical Sciences, University of Umea, Sweden. Professor Hernell has made a distinguished contribution to clinical nutrition through hundreds of publications, and his work on many prestigious scientific committees, including the Swedish National Committee of Nutritional Science.

Introducing his lecture, Professor Harnell pointed out that the artificial nutrition pioneer Arvid Wretling, in addition to his well-known contribution to the study of parenteral nutrition, has also made important contributions to the understanding of paediatric enteral nutrition.

Fat is a major nutrient - its role as a source of chemical energy and essential fatty acids, as a precursor of eicosanoids, and as a food chain vehicle for fat-soluble vitamins ensures that an adequate intake of dietary fat is essential for life and well-being. However the health risks of excessive fat intake are well known.

Professor Hernell reviewed the key steps in fat digestion - from emulsification through lipase catalysed hydrolysis to absorbable products, solubilisation and transport of these products, then their absorption (membrane translocation), intracellular re-synthesis, lipoprotein formation (dispersion in water) and transport into lymph.

He showed how structure-function studies had spurred a deeper understanding of the molecular biology of the many lipases involved in fat digestion - including gastric, pancreatic, intestinal, microbial, colipase-dependent lipase, procolipase, phospholipase A2, carboxylester lipase (CEL) and bile salt-simulated lipase (BSSL).

This understanding at the molecular level has suggested new ways of manipulating fat metabolism, including the ability to increase fat absorption via manipulation of the physical properties of lipid substrate and the use of structured triglycerides (STG) or lipase substitution.

Recently this had led to a great deal of interest in the use of BSSL as substitution therapy. BSSL, a non-specific lipase activated at the site of action, has many properties which enhance its suitability as therapy. It is stable during storage and can be orally administered. Once ingested, it is resistant to gastric acidity and proteases.

Moreover, recombinant BSSL can be expressed by mammalian cells and produced in transgenic sheep. Pilot clinical studies using recombinant BSSL in adult patients with chronic pancreatic insufficiency have recently been initiated. At the other end of the fat spectrum is the pressing need to reduce fat absorption in many patients. Professor Hernell described progress in reducing fat absorption by interfering with lipolysis via the inhibition of single or multiple enzymes or via micellar solubilization (plant sterols) - work which had led to recent introduction of agents such as orlistat.

How pharmacists can reduce oxidation

Eliminating oxygen during admixing and storage aims to reduce lipid peroxidation, which has shown important roles in the clinical situation, said Stefan Muhlebach from Switzerland. In the first Michael Barnett Lecture on the topic of peroxidation of intravenous lipid emulsions, given as part of Tuesday's Pharmaceutical Practice Symposium, he said this could be optimised by the use of an appropriate admixing device.

Pharmacists should store ready to use all-in-one admixtures protected from light at 2-8 C°. Wherever possible, trace elements should be added immediately before administration, and always with attention to aseptic handling. But he added that "multivitamin admixtures show high interactive potential with trace elements and other components and might be administered better as a small volume infusion at the beginning of daily parenteral nutrition."



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How safe is standard TPN?

Despite declaring himself a “standardisation sceptic” Tony Nunn, Director of Pharmacy, Royal Liverpool Children’s Hospital, told Tuesday’s Pharmaceutical Practice Symposium that he was shifting his opinion.

He presented a brief review of standard TPN, which showed that “standard TPN seems to be common practice for neonates, but we’ve been poor in publishing the results and telling each other what we are doing.” For infants and children he found very little information at all. “We don’t know what the nutritional outcomes are when standard TPN is compared to tailored TPN – we don’t know whether one is better than the other.”

Despite this he said, “I feel very strongly now that there is much greater risk associated with individual compounding, and that we should be moving away from it.” As part of the project, his co-workers interviewed and sent questionnaires to 200 clinicians (pharmacists and doctors) in five European countries. They had a 40% response rate. One of the questions asked was whether parenteral nutrition (PN) was compounded on the wards or in the pharmacy. The results suggested that some 20% of PN for children was still compounded on the wards of European hospitals, although there were some interesting country-specific differences.

“In the UK it is very rare to compound PN on the ward, whereas in Germany it was really quite common,” he said. Similarly, in France and Spain it was also unusual, but in Italy it was fairly common.

They also looked at why individual hospitals continue to compound PN for individual patients on the wards. “The majority of responders who were compounding said it was because of the great variability in nutrients from day to day. When asked, some 30% of respondents said they would not consider changing to standard TPN solutions.”

However, he said that commercial preparation of acceptable regimens was possible, although future work should focus on finding regimens that were acceptable across Europe – commercial production would only be viable for the Europe-wide market. “We also need to educate and train each other in the way in which we use these things and also to see what the benefits of using standard versus tailored TPN might be,” said Mr Nunn.

“Take hospital nutrition teams out into the community”

Time spent in hospital represents a relatively small but critical fraction of the patients’ journey through illness that often determines whether patients will improve or not.

Yet, as Professor C. Pennington, Ninewells Hospital, Dundee, and president of the British Association for Parenteral and Enteral Nutrition, told the ASPEN-ESPEN Symposium undernutrition in hospitals is widespread.

“There is little data but the data we have shows that many patients are being overlooked.” Professor Pennington said this was often because many doctors and even nurses had little interest in nutrition and did not screen patients’ nutritional status. Since hospital food rarely supplied patients with sufficient nutrients, clinicians were addressing only the tip of the iceberg. One solution to this problem, he proposed, was an expansion of the role of the hospital nutrition team

beyond its traditional role. “Although they will need to maintain quality of management in parenteral nutrition and will need to be available, the hospital nutrition team should have a wider remit that extends into the community and isn’t just focused on the hospital.”

Professor Pennington said the composition of the team should be multi-professional and multi-disciplinary – although he warned against creating huge teams. He also thought the team “should relate to its national societies to promote uniform standards, audit and in particular to facilitate research.”



What do we mean by 'quality of life'?

While clinicians are generally interested primarily in clinical outcomes, patients are more concerned with how their treatment is likely to impact upon their lifestyle – the so-called 'quality of life' issues. The question of what is meant by 'quality of life' and how it is measured was addressed by Dr J.L. Pais-Ribeiro from the University of Porto, Portugal.

He pointed out that people commonly speak about 'quality of life' when addressing emotional feelings, personal relationships and professional happenings. But there were several measures currently available for evaluating health related quality of life: "The measures can be general in that they are applicable to any patient regardless of the prevailing medical condition, or they can be specific for a certain disease."

He cited the example of the European Organization for Research and Treatment of Cancer (EORTC) as an example of an organization that provides quality of life measures for cancer patients. The QLQ-C30 is

a multidimensional questionnaire with 30 items that measure physical, role, emotional, cognitive and social functioning, as well as global health status. In addition, it includes items that can be used to measure fatigue, nausea and vomiting, pain, dyspnoea, insomnia, appetite loss, constipation and diarrhoea.

Although as Dr Pais-Ribeiro said "quality of life evaluation is yet in its early stages", the availability of such questionnaires has potential application, both in clinical research, where they can be used as an outcome measure, and as a clinical tool in everyday practice.

Take the time to learn from your patients

The days when patients were passive recipients of medical care are gone. In all aspects of clinical practice the patients' opinions are increasingly important and acted upon. An educational session on Tuesday morning showed that clinicians can learn much from patients and their expectations of therapy.

Carolyn Wheatley, a home parenteral nutrition patient, said each patient was "one of many" and therefore needed individual help in adapting to life 'on-line'. It was important for clinicians to find time to discuss individual needs and expectations, ensuring "that all parties understand ongoing care and perceived outcomes."

Although the success of therapy will often be apparent, the associated problems and risk of intravenous feeding are not fully apparent until they happen: "The simplest of problems may be exacerbated if the promised and perceived support is not there." Patients need access to support and expert knowledge, which is often provided by

patient support groups such as Patients on Intravenous and Nasogastric Nutrition Therapy in the UK, the group that Carolyn chairs.

Such groups can help caregivers to improve research and clinical practice, as C Jonkers-Schuitema from the Academic Medical Center, Amsterdam, The Netherlands, explained.

The Dutch Patient/Client Federation is an umbrella organization that covers many patient groups. It has developed quality criteria for dietitians, physiotherapists and other professions allied to medicine, always putting forward the patient point of view.



Nutrition trials: from evidence to implementation

Adoption of evidence-based medicine in clinical nutrition is being hampered by the lack of adequate data from randomised controlled trials.

Dr R. Meier from the Division of Gastroenterology and Hepatology, University Hospital Liestal, Switzerland, told Monday's educational session on quality management in clinical nutrition that clinical guidelines were becoming an increasingly familiar tool in clinical practice. But these were only successful when they were simple, clear, well accepted by health care professionals, and regularly updated to reflect new evidence.

Dr F. Dörje, Department of Pharmacy, Erlangen University Hospital, Germany, pointed out that evidence-based guidelines developed by professional societies often did little to change practice behaviour at a local level without effective implementation strategies.

Implementation is a multidisciplinary task – in his hospital it had been undertaken by the Nutrition Subcommittee of the Pharmacy & Therapeutics Committee – and required time, commitment and resources.

He suggested that the implementation framework encompass:

- Prioritising clinical topics by creating a tension for change
- Finding, appraising and adapting valid guidelines
- Dissemination and implementation by providing, developing and building support
- Evaluating implementation by developing a mechanism for feedback.

In order to undertake quality improvement in nutrition, it is necessary to assess the impact of clinical nutrition on outcome. Dr T. Mossberg, Department of Health Services, The National Board of Health and Welfare, Sweden, presented the results of a Swedish literature review on protein-energy malnutrition that highlighted the relative lack of data from prospective randomised studies with endpoints of functional capacity, morbidity or mortality.

The studies mostly dealt with anthropometric and biochemical variables, but as Dr Mossberg pointed out “it is not certain that the nutrition-induced increase in anthropometric or biochemical variables improves the patient's prognosis or that the functional capacity is improved.”

He said that restoring lean body mass was an important aim of nutritional support “but function does not relate to increased weight. Nutritional treatment can affect organ function faster than its size and mass.”

Good prospective studies with functional endpoints were urgently needed, he said. But he added that the lack of data on nutritional support in different conditions should not be taken as justification for not providing sick patients with nutrition. “Every patient has the right to have adequate nutritional support,” he stressed.

Later in the day, ASPEN President Professor P. Schneider told the ASPEN-ESPEN Symposium that clinical guidelines were often introduced because of the cost and the resource issues facing health care systems, but that they did have the potential to improve the safety of nutritional support.

Professor D. August from the Department of Surgery at the Cancer Institute of New Jersey, has chaired the committee responsible for updating the ASPEN guidelines on parenteral and enteral nutrition in adult and paediatric patients. His presentation showed just how time consuming and labour intensive the process of guideline production can be. Revising the previous guidelines began in May 1999 – and will be published as a supplement to the *Journal of Parenteral and Enteral Nutrition* early next year and will be available at Nutrition Week in San Diego in February 2002.



Poster round up - Part I: a selection from ESPEN 2001 posters

Risk of underfeeding in ICU is quantified

There is currently much debate about the risks associated with both overfeeding and underfeeding ICU patients. An important contribution to this debate has been made in a study presented by C. L. Reid and I. T. Campbell, University Department of Anaesthesia, Withington Hospital, Manchester, UK.

Their study confirms that if ICU patients are allowed to develop a cumulative energy deficit of more than 10,000 kcal then this is associated with a longer stay in the ICU but not with increased mortality. In the study, 56 MODS patients were fed enterally via an NG tube with feeding adjusted to meet changes in energy expenditure. There was a significant association between cumulative energy deficit during ICU admission and length of ICU stay. The Manchester report adds to other presentations at this week's meeting about the hazards of underfeeding the ICU patient.

Malnourished patients in EU hospitals: need for recognition

Malnutrition appears to be a risk factor for both increased length of hospital stay and in-hospital death, according to a seven-country European study.

H. Kruijenga and colleagues from the Departments of Dietetics and Psychiatry, VU Medical Centre, Amsterdam, The Netherlands, found that malnutrition was under-recognised and under-treated. They recommended that admission screening is used to detect malnourished patients.

The study included 2,477 patients admitted to eleven wards from seven European countries (the Netherlands, Spain, Italy, Portugal, Denmark, Hungary, Germany). Length of hospital stay and in-hospital death increased with increasing severity of malnutrition. Referral to a dietitian occurred in only a minority of malnourished patients and was not related to the degree of malnutrition.

"Malnourished patients appeared to be at increased risk of an extended length of stay and in-hospital death. No relationship was observed between the prevalence of malnutrition and dietetic consultation. Results suggest that the recognition and treatment of malnutrition are still undervalued and that other methods to detect malnourished patients in a standardised way should be considered, such as admission screening," the researchers concluded. The same pattern of findings occurred in all seven participating countries.

Immunonutrition shows promise in liver transplantation

Use of an immune-enhancing diet in liver transplantation may improve preoperative nutritional status, hasten recovery and reduce postoperative infectious complications, according to a pilot study by the University of Auckland and the NZ Liver Transplant Unit, Auckland Hospital, New Zealand.

In the study, fifteen patients received Oral Impact® (0.5L/d) for a median 54 (range 10-168) days while listed for liver transplantation and enteral Impact® for at least five days following transplantation. Nutritional status (total body protein measured by neutron activation) was assessed on commencing the study, immediately prior to and 15 and 180 days post-transplantation.

The results were compared with 36 non-supplemented transplant patients. "The results showed that all patients tolerated the supplement with no safety concerns," the authors reported. Preoperatively total body protein increased by 0.42 ± 0.15 kg ($p=0.017$). Postoperatively a 0.71 ± 0.24 kg loss of total body protein over the first 15 days ($p=0.026$) was regained by 180 days. In the non-supplemented patients, total body protein did not change preoperatively and only 40% of the 0.92 ± 0.10 kg loss after transplantation was regained at 180 days. Infectious complications occurred in 5/15(33%) supplemented and 21/36(58%) non-supplemented patients. "Impact may improve preoperative nutritional status, hasten recovery after liver transplantation, and reduce postoperative infectious complications. These benefits need to be confirmed in a randomised trial," the authors concluded.