

Featured Review

Pathophysiology of Thalassemia (Yesim Aydinok, MD) – see page 2

Announcements

Final Review of ITHANET Framework Programme 6 Phase

The ITHANET consortium has passed its final review by the European Commission (EC), with an ongoing commitment of key partners to continue contribution and provision of electronic infrastructure facilities and to work towards a renewed network under EC Framework Programme 7.

Safe Handover – ITHANET Portal to See Significant Development

The ITHANET Portal has received funding from the Cypriot Research Promotion Foundation for further development over the next two years. Changes will include more interactivity, implementation of multi-language support, expansion of database and text content, availability of password-protected workspaces for discussions and exchange of data, and streamlining of menus and interfaces.

The main objective of the next phase of development is the establishment of the ITHANET Portal as a daily scientific and diagnostic tool in research and treatment, and as a resource for patients, carriers, and all those interested in haemoglobinopathies. The ITHANET Team envisages a second-generation web site that expands and interlinks the existing text and database sections, but is easily accessible and, through wiki-based implementation of substantial parts of its content, virtually self-maintaining long-term. The planned multi-language support will attract a greater numbers of lay users, introduce them to e-learning, facilitate their discussion of pertaining issues with their peers, and move the discussion and resolution of health problems into the sphere of everyday interactions and experiences. Moreover, an improved structure and interface will make information held on the ITHANET Portal readily accessible for patients and health professionals alike, and will help create an interface between them through forum discussions of medical and bioethical topics of interest.

Planned Features for the ITHANET Portal

- database expansion
- interactive database browser
- multi-language support
- wiki-based text content
- password-protected forum discussions and data exchange

Upcoming Events

British Society for Gene Therapy 6th Annual Conference

Organizer: British Society for Gene Therapy (BSGT)
Date: 21–23 April 2009
Venue: Royal Holloway University, London, UK
Web Site: <http://www.bsgt.org.uk/Meetings/Meetings.aspx>

17th European Association for Red Cell Research Meeting

Organizer: Europ. Assoc. for Red Cell Research (EARCR)
Date: 23–27 April, 2009
Venue: Milano, Italy
Web Site: <http://www.earcr2009.org>

1st Pan-Middle East Conference on Haemoglobinopathies

Organizer: Thalassaemia International Federation (BSGT)
Date: 1–2 May 2009
Venue: Four Seasons Hotel, Damascus, Syria
Web Site: www.thalassaemia.org.cy

22nd International Symposium on Technological Innovations in Laboratory Hematology

Organizer: Int. Soc. for Laboratory Hematology (ISLH)
Date: 11–14 May 2009
Venue: Las Vegas Hilton, Nevada, USA
Web Site: http://www.islh.org/ISLH_2009/

8th Balkan Meeting on Human Genetics

Organizer: Balkan Meeting on Human Genetics (BMHG)
Date: 14–17 May, 2009
Venue: Cavtat-Dubrovnik, Croatia
Web Site: <http://www.studiohrg.hr/human-genetics2009/>

American Society of Gene Therapy 12th Annual Meeting

Organizer: American Society of Gene Therapy (ASGT)
Date: 27–31 May 2009
Venue: San Diego, CA, USA
Web Site: <http://www.asgt.org/am09/>

10th International Symposium on Mutations in the Genome

Organizer: Genomic Disorders Research Centre, Australia
Date: 28 May – 1 June 2009
Venue: Coral Beach Hotel, Paphos, Cyprus
Web Site: <http://www.mutationdetection.org/Cyprus>

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ITHANET Portal at
www.ithanet.eu

membrane changes produce rigid and deformed thalassemic RBCs, resulting in their accelerated, premature destruction in the bone marrow (BM), known as ineffective erythropoiesis, and their entrapment in the spleen. Ineffective erythropoiesis and hemolysis are underlying causes of severe anemia, which in turn stimulates the synthesis of erythropoietin, leading to expansion of ineffective BM as much as 30 times the normal level. BM expansion produces characteristic bone deformities of the skull and face as well as osteopenia, and leads to increased iron absorption, which contributes to iron overload [2, 3]. In thalassaemia-intermedia patients, who are not receiving transfusions, it is indeed increased gastrointestinal iron absorption that is responsible for increases in iron burden, depending on the severity of erythroid expansion, while hypersiderosis in thalassaemia-major patients predominantly derives from blood transfusions, albeit exacerbated by excess iron absorption. The combination of iron overload and increased outpouring of catabolic iron from the reticuloendothelial system overwhelm the iron binding capacity of transferrin, resulting in toxic non-transferrin-bound plasma iron (NTBI). NTBI promotes the formation of free hydroxyl radicals and accelerates the peroxidation of membrane

lipids. Both, lipid peroxidation and TGF β -1 expression, resulting from iron overload, may promote hepatic injury and fibrogenesis [4]. It has been reported that transferrin-iron uptake by heart cells is inhibited at high tissue iron concentrations, whereas NTBI uptake is increased and results in myocardial lipid peroxidation and abnormal contractility [5]. In other tissues, similar mechanisms are likely to be involved and in the absence of effective iron chelation therapy result in hypogonadism, diabetes, hypothyroidism and hypoparathyroidism.

New approaches highlighted by recent research findings on the pathophysiology of β -thalassaemia will likely aid an improved management of the disease in future. For instance, fragmentation and rigidity of thalassemic red cells have been ameliorated in a mouse model by exposure to agents that bind membrane iron [6]. Moreover, while hepcidin levels normally increase and inhibit iron absorption in small bowel when iron stores are elevated, hepcidin levels were found to be inappropriately low in patients with thalassaemia [7], indicating administration of hepcidin or hepcidin inducers as a possible treatment against gastrointestinal iron absorption.

References

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