BOLETIM

Sociedade Portuguesa de Hemorreologia e Microcirculação

Bulletin of the Portuguese Society of Hemorheology and Microcirculation

Vol. 24 n.º 4 Outubro, Novembro, Dezembro 2009

Sumário / Summary

Sociedade Portuguesa de Hemorreologia e Microcirculação

Presidente Honorário: Prof. Doutor João Alcindo Martins e Silva

ÓRGÃOS SOCIAIS DA SPHM / BOARDS (2007-2009)

Direcção / Executive Committee

Presidente
Prof.ª Doutora Maria Carlota Saldanha Lopes

Vice-Presidentes
Prof. Doutor J. M. Braz Nogueira
Prof. Doutor Carlos Perdigão

Secretário-Geral
Dr. José António Pereira Albino

Tesoureiro
Prof. Doutor Flávio Reis

Secretários-Adjuntos
Prof. Doutor Henrique Luz Rodrigues
Prof. Doutor J. Ducla Soares
Dr. Jorge Lima

Assembleia Geral / General Assembly

Presidente
Prof. Doutor A. Diniz da Gama

1.º Secretário
Dr. João Paulo Guimarães

2.º Secretário
Dr. Miguel Frederico Leal Galvão

1.º Secretário Suplente
Dr. Luís Sargento

2.º Secretário Suplente
Dr. Paulo Ferreira da Silva

Conselho Fiscal / Finance and Audit Committee

Presidente
Prof. Doutor Victor Oliveira

1.º Vogal
Dr.ª Maria Helena Baptista Manso Ribeiro

2.º Vogal
Dr. Carlos Manuel dos Santos Moreira

Comissão de Delegados / Committee of Delegates

Delegado da Região Norte
– Dr. Manuel Campos
Delegado da Região Centro
– Dr. João Morais
Delegado da Região Sul e Regiões Autónomas
– Dr. Mário Marques

MEMBROS CONSULTIVOS, HONORÁRIOS E CORRESPONDENTES / / CONSULTIVE, HONORARY AND CORRESPONDENT MEMBERSHIP

Conselho Científico / / Scientific Council

A. Diniz da Gama
Axel Pries
Fernando Lacerda Nobre
Helena Saldanha Oliveira
J. Esperança Pina
J. Luís Providência
J. Martins e Silva
J. Fernandes e Fernandes
J. Rafael Ferreira
João Morais
José Ferro
Luís Silva Carvalho
Manuel Carrageta
Mário Andreia
Ricardo Seabra Gomes

Sócios Honorários / / Honorary Members

A. M. Ehrly (Alemanha)
Carlos Ribeiro (Portugal)
H. J. Meiselman (EUA)
Helmut Drexler (Alemanha)
J. F. Stoltz (França)
J. E. Tooke (G. Bretanha)
John A. Dormandy (G. Bretanha)
Joaquim Silva Carvalho (Portugal)
J. M. G. Toscano Rico (Portugal)
L. Teixeira Diniz (Portugal)
M. Boisseau (França)
Políbio Serra e Silva (Portugal)
Sandro Forconi (Itália)
Y. Isogai (Japão)

Sócios Correspondentes / / Correspondent Member

Adrian J. Barnes (G. Bretanha)
Alon Harris (USA)
D. Seiffge (Alemanha)
G. Caimi (Itália)
G. D. O. Lowe (G. Bretanha)
I. Juhan-Vague (França)
I. Salama Benarroch (Argentina)
J. Delaunay (França)
J. F. Brun (França)
Ricardo Manrique (Brasil)
Shi Yong-de (China)
T. Shiga (Japão)
Tao Chan (França)

FILIAÇÃO INTERNACIONAL

EUROPEAN SOCIETY FOR CLINICAL HEMORHEOLOGY
EUROPEAN SOCIETY FOR MICROCIRCULATION

Referência da capa: Vénula pós-capilar (diâmetro aproximado: 30 mm) de rede microvascular em mesentério de rato (*Rattus norvegicus*), observada por microscopia intravital de transiluminação. No interior do vaso sanguíneo visualizam-se leucócitos a interagir com a parede vascular. Imagem obtida por Henrique Sobral do Rosário (Instituto de Biopatologia Química – Prof.a Doutora Carlota Saldanha, Faculdade de Medicina de Lisboa; Unidade de Biopatologia Vascular, Instituto de Medicina Molecular)

Esta publicação é subsidiada em 2009 por:
FCT: Fundação para a Ciência e Tecnologia (Ministério da Ciência e do Ensino Superior – Portugal)
Ao abrigo do: **Apoio do Programa Operacional Ciência, Tecnologia, Inovação do Quadro Comunitário de Apoio III**

O Boletim (ISSN 0872-4938) é publicado trimestralmente pela Sociedade Portuguesa de Hemorreologia e Microcirculação. Isenta de registo no ICS nos termos da alínea a) do n.º 1 do artigo 12.º do Decreto Regulamentar n.º 8/99, de 9 de Junho. **Depósito Legal** 30 525/89. **Tiragem** 100 exemplares **Distribuição** sócios, sociedades científicas afins, entidades oficiais e privadas de âmbito médico e áreas de educação da ciência. Todos os direitos estão reservados. **Preço de cada número avulso:** 5 €, a que acresce 2,5 € para portes de correio. **Editor, Proprietário, Administração e Secretariado:** Sociedade Portuguesa de Hemorreologia e Microcirculação, a/c Instituto de Biopatologia Química, Faculdade de Medicina de Lisboa. **Endereço do Secretariado:** Apartado 4098- 1502 Lisboa Codex, Portugal. **Telefone** 217 985 136; Fax: 219 999 477 **Execução Gráfica:** Publicações Ciência e Vida, Lda. Apartado 44 – 2676-901 Odivelas. **Telef.:** 21 478 78 50; **Fax:** 21 478 78 59. **E-mail:** pub@cienciaevida.pt

HEMORREOLOGIA NA PROMOÇÃO DA QUALIDADE / PROMOTING QUALITY IN HEMORHEOLOGY

A organização pela SPHM de conferências de Hemorreologia Clínica iniciou-se em 1982 com o 1st International Symposium on Erythrocyte Deformability, Microcirculation and Vascular Pathology, em Lisboa. A participação de elementos da SPHM nas conferências internacionais começou no ano seguinte, na 3rd European Conference on Clinical Haemorheology realizada em Baden-Baden. Desde então e até à recentemente realizada 15th, em Pontresina/St Moritz, na Suiça, tem sido reservado nos programas desses eventos espaço para debates sobre metodologia, equipamentos, *guidelines* sobre o processamento das amostras de sangue e o controlo da qualidade. Uma relevante proporção de artigos publicados nos boletins e revistas de sociedades nacionais e, em particular, em jornais internacionais da especialidade (designadamente, *Clinical Hemorheology and Microcirculation, Biorheology, Microcirculation* e *Vascular Medicine*) abrange as condições de colheita e armazenamento, a acção dos anticoagulantes e suas influências nos parâmetros hemorreológicos e microcirculatórios. Consoante os equipamentos, têm sido publicados estudos sobre a acção de factores como a temperatura, osmolalidade, força iónica e proveniência da amostra de sangue, de acordo com a espécie do ser vivo. No que respeita às características intrínsecas ao ser humano(nomeadamente quanto ao género, idade, índice de massa corporal, estado de saúde, actividade física, hábitos alimentares , alcoólicos e tabagismo) e às extrínsecas relacionadas com a natureza (tal como a altitude e estação do ano) são muitos os valores de referência para os parâmetros hemorreológicos na dependência do equipamento. Exceptua-se aqui a viscosidade plasmática, pois que devido às características de fluido Newtoniano, todos os aparelhos comercializados fornecem valores idênticos apesar de baseados em princípios diferentes.

Os processos de garantia da qualidade têm que ser dinâmicos e criativos tanto na ciência hemorreológica como em qualquer outro nicho da cultura. Na associação das universidades europeias multiplicam-se e diversificam-se as acções na promoção da garantia da qualidade do ensino e aprendizagem no ensino superior, de modo a acompanhar a globalização e a diversidade cultural

Neste propósito merece destaque a actualização do controlo de qualidade na determinação laboratorial dos parâmetros hemorreológicos, recentemente apresentada pelo grupo de peritos do “International Expert Panel for Standardization of Hemorheological Methods” no artigo “New Guidelines for Hemorheological Laboratory Techniques”, publicado em *Clinical Hemorreology and Microcirculation* (2009). Além de es-

pecificações, orientações sobre a quantificação dos parâmetros e cuidados e normas de colheita acima mencionadas, também acrescem considerações sobre o desenho de estudos clínicos e advertências na aplicação da análise estatística. Pelo trabalho realizado e agora publicado naquele artigo, os hemorreologistas continuadores de Alfredo Copley, que se dedicam aos estudos clínicos/básicos, laboratoriais, aos de inovação instrumental e aos interventores em redes com cientistas das áreas da biomecânica, da física, e das ciências biomolecular, micro e macrovascular estão, por isso, de parabéns. Porém, ainda há muito caminho a desbravar na inovação de equipamentos que facultem a rotina da avaliação do estado hemorreológico dos doentes em ambientes hospitalar e no ambulatório.

Também os editores do *Clinical Hemorreologia and Microcirculation* estão de parabéns porque o factor de impacto desta revista quase duplicou em dois anos, o que reflecte o esforço e o empenho dos que nela publicam e das ideias dos consultores para renovar o espírito do jornal.

Nesta reflexão espelha-se a motivação que tem ocorrido na cultura hemorreológica para a sua promoção sempre com o auxílio dos mentores da garantia da sua qualidade.

Comunicar os resultados, submetê-los ao escrutínio, modificando o que está mal, inovando na base do que se vai sabendo, expandindo e experimentando a criatividade possibilitará consolidar e ou adaptar as *guidelines* às realidades que vão surgindo.

Desejo a todos boas práticas na cultura da qualidade da e para a vida da Humanidade.

Excelente 2010 a todos que acedem ao nosso *site*

Carlota Saldanha
Presidente da SPHM

THE ACTIVE LEVEL OF THE RESEARCH OF BLOOD RHEOLOGY PRESUMED BY BIBLIOMETRIC EVALUATION / O NÍVEL DA INVESTIGAÇÃO EM REOLOGIA SANGUÍNEA PRESUMÍVEL ATRAVÉS DA AVALIAÇÃO BIBLIOMÉTRICA

Yukihide Isogai, Shinichi Abe***

INTRODUCTION

There is a modality of assessment that has the output of the number of research papers as a method of capturing and finding the briskness of the research. This is called bibliometric evaluation. To retrieve the medical literature easily by using the internet Medline today had been changed in many phases. Medline (MEDLARS on Line) by online services was developed in the 1970's. Literature retrieval system PubMed that we are using in daily study is called Internet version Medline.

The purpose of this paper is to estimate the trend and the active level of a recent research in the Clinical Hemorheology field because it is possible to retrieve the document by Medline.

METHOD OF STUDY

The number of pertinent papers was investigated from the aspect of the blood rheology with using Medline about the following key words: ① blood viscosity, ② erythrocyte (red cell) deformability, ③ leukocyte deformability and ④ blood viscoelasticity.

1) The above-mentioned each key word was displayed in bulk as "Blood Viscosity and Related Article".

2) The investigation of the number of papers in line with the various diseases and the blood rheology factors. The retrieval methods were PubMed (Medline 1966-2009 years) and Old Medline (1950-1965).

The comparison of the numbers of papers according to the diseases were settled: a) diabetes and other diseas-

*Japan Medical Mission, Kinugasa General Hospital
2-23-1 Koyabe Yokosuka-shi, Kanagawa Prefecture,Zip code:238-8588
** The Jikei University School of Medicine, Academic Information Center, Library
3-25-8, Nishi-shimbashi Minato-ku, Tokyo, Japan, Zip code:105-8461

es; b) Hematological disease; c) Cardiovascular disease; d) Cerebrovascular disease; e) Hepatic disease and f) Collagen disease.

3) The object of comparison items was divided into three categories.

I. All "Blood viscosity and related articles": diseases and conditions were assumed to be a retrieval item. It was above-mentioned a) – f) settled not only those diseases but also all other diseases for instance, high blood pressure, shock, the pregnancy, and the effects of the medical drugs were included.

II. "Diabetes and related articles."

III. "Groups of disease and related articles" other than Diabetes: Above-mentioned b)-f) disease groups.

4) The paper retrieval was done in the period from 1950 to March, 2009, subtotaled every four years, and shown by the time series.

RESULTS

The output of research papers were retrieved by Medline from 1950to 2009 every four years and shown by time series. Although there were already appeared in International journal of Biorheology and Clinical Hemorheo1ogy and Microcirculation including blood rheology, but it was behind contents of these journal having come to appear in PubMed from 1965 and 1997 respectively.

The output of research in rheological papers showed the highest number for four years of 1990-1993 shown in Table I. A sudden extension

Table I – Number of papers of hemorheology retrieved by Medline from 1950-2009. Subtotal numbers of papers were taken in every 4 years.

	All"Blood viscosity & relateted articles"*	Diabetes : blood viscosity & rerated articles*	Various diseases (excluded DM) & related articles*
1950-1953	31	1	7
1954-1957	33	0	8
1958-1961	36	1	5
1962-1965	243	2	122
1966-1969	629	15	266
1970-1973	769	28	375
1974-1977	972	39	546
1978-1981	1,242	70	683
1982-1985	1,719	128	947
1986-1989	1,904	110	1,093
1990-1993	1,998	110	1,226
1994-1997	1,572	82	875
1998-2001	1,524	89	812
2002-2005	1,681	88	847
2006-2009	1,482	71	595
Total	15,815	834	8,394

* "Blood viscosity & related articles": ① blood viscosity, ② erythrocyte deformability, ③ leukocyte deformability and ④ blood viscoelasticity.
Various diseases [excluded: a) DM; b) Hematological disease; c) Cardiovascular disease; d) Cerebrovascular disease; e) Hepatic disease and f) Collagen disease]

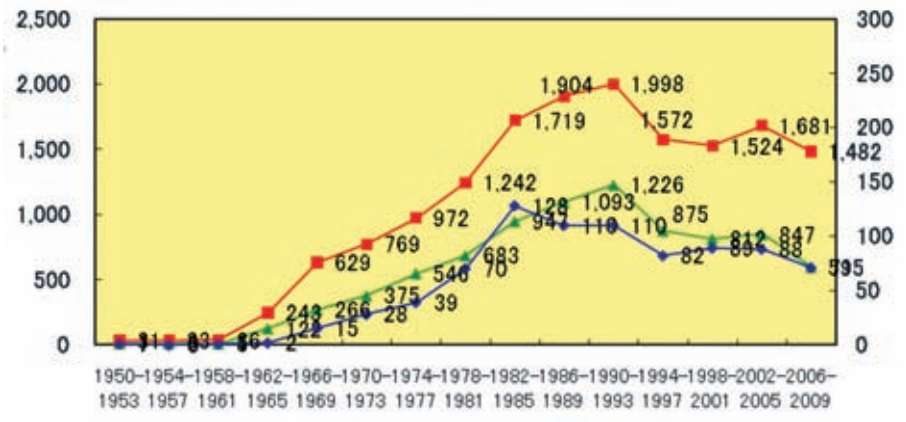


Fig. 1 – Drawn a graph of Table I, the y vertica1 line was indicated a quantity of papers and horizontal axis indicated years. The number of paper was shown in a right y vertical line showing the diabetes. ■ – All "blood viscosity & related articles": ① blood viscosity, ② red cell deformability, ③ leukocyte deformability and ④ blood viscoelasticity. ▲ – Various diseases excluded including: a) DM; b) Hematological disease; c) Cardiovascular disease; d) Cerebrovascular disease; e) Hepatic disease and f) Collagen disease . ◆ – Diabetes

of the paper had been seen since1978, though till then, an increase of papers comparatively showed the gradual. On the other hand, a decrease was recognized rapidly as for the number of the paper production after 1998.

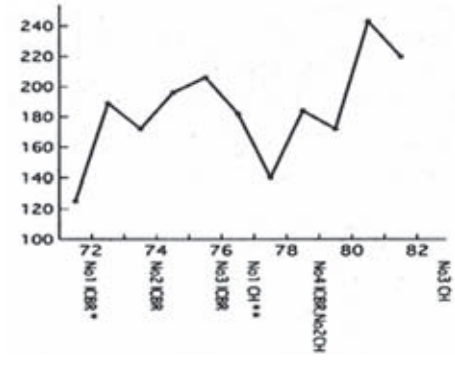
The output of the papers had been indicated the highest value for four years of 1990-1993 shown in Table I.

In Fig. 1, The upper running solid red square mark connecting line showed all “Blood viscosity & related articles including the various diseases and the pathophysiology, etc.”. The solid green triangle mark connecting line showed “Various disease groups [b)-f)]”, and the solid blue diamond-shaped mark connected line showed “Diabetes”.

As for the age, the computerized search was not able to be used even though it was retrieved by Index Medicus. The results showed to suggest today’s trend.

Fig. 2 was a graph of Table II, in which where the change of “Number of papers regarding viscosity of blood (1972-1983, 3.)” was drawn. While tracing the graph, increasing tendency was seen while repeating the increase and decrease. “ICBR" and “CH” described in the horizontal axis were the abbreviation of “International Congress on Biorheology” and “European Conference on Clinical Hemorheology" respectively. An increase of the number of papers was recognized before and after of those meetings’ holding years.

Table III showed the first autour’s nationality and the number of paper in blood rheology in publishing jour-



* ICBR: International Congress of Biorheology
** CH: International Conference of Clinical Hemorheology

Fig. 2 – References of “Blood Viscosity” in clinical medicine search by Index Medicus, 1972-1983

Table II – Number of papers related "Blood Viscosity" retrieved by Index Medicus, from 1972 to March 1983. The counting of upper four prizes as following: effects of medical drugs, paraproteinemia, ischemic heart disease and diabetes mellitus.

	'72~74	'75~79	'80~83	Subtotal
Hypertension	22	28	31	81
Ischemic Heart Disease	34	71	55	160
Cerebrovascular Disorder	12	33	38	83
Shock	21	28	21	70
Thrombosis	35	34	22	91
Raynaud's Disease	4	15	18	37
Paraproteinemia	36	81	53	170
Diabetes Mellitus	25	44	56	125
Pregnancy	8	28	25	61
Effect of Medicine	67	143	121	331
Total	264	505	440	1209

nal issue classfication by countries. As for the belonging, First author's unknown nationality was excluded.

Slashing bars meant the country of publishing journals or books, blue bars showed first author's nationality (only described).

Fig. 4 displayed a retrieval of the papers published in the Japanese journals and proceedings[5] about the blood rheology the same as in Table 1, those were viscosity of blood, erythrocyte deformability, leukocyte deformability and blood viscoelasticity.

DISCUSSION

Brief History of Medline

The starting point of Medline was "Index Medicus: a monthly classified record of the current medical literature in the world (henceforth IM Old Series). This was assumed the start for the purpose of reducing the labor of the document retrieval for present American national library (National Library of Medicine, NLM) since 1879. However, the continuance of publication became difficult because of financial difficulties in 1927, though this IM OLD Series continued in vicinity for 50 years. The other side, American Medical Association had issued "Quarterly Cumulative Index to Current Medical Literature" (QCICML) beside IM OLD. In 1927, IM OLD series and QCICML obtained the help of the Car-

Table III – Blood rheology paper output of classification by countries

	The first author belonged country (author's who describes)	Publishing journal or book issue countries
United State of America	2101	5470
United Kingdom/Scotland	467	2505
Switzerland	118	609
Sweden	144	134
Russia/USSR	77	976
Poland	81	168
Netherlands	180	1117
Japan	612	483
Italy	380	549
Germany	527	1303
France	402	377
China	328	620
Canada	212	88

negie Foundation, and came to be issued a new Quarterly Index Medicus (QIM). And then, the publication of IM NEW Series started in 1960 through the age of a hard-to-find foreign magazine of the Second World War.

Afterward medical document analysis, and search engine (Medical Literature Analysis and Retrieval System, MEDLARS) this led to development, and it became Medline of today repeatedly the upgrade[1].

Bibliometric Evaluation

The activity situation of the blood rheology research was presumed in the output of the research papers that was called Bibliometric Evaluation.

Medline was a literature database in the medical science field, and it was used as information resources that support the document retrieval necessary for the academic activity.

On the other hand, it could be said that the productivity of the research paper was assumed to be an index, and the meaning of the medical research analysis was clarified because it was appreciable as the extension and the evaluation tool in the field of the academic activity.

In addition, the analysis that pays attention to the production of paper was taken up as basic material in advancing the scientific policy of the nation.

"International comparison investigation of the science paper : trends of the paper output of the science, engineering, and medical fields" of 1995-1996 was published by old National Center for Science Information Systems in Japan (Editors-in--Chief: Masamitsu Negishi and Sigeaki Yamazaki) in Japan[2].

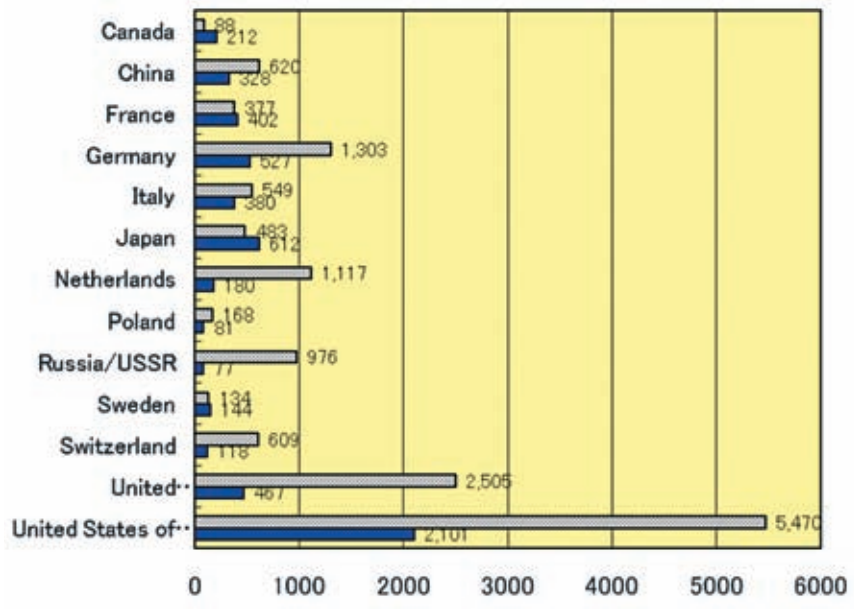


Fig. 3 – The graph was showing of Table III in horizontal bar chart

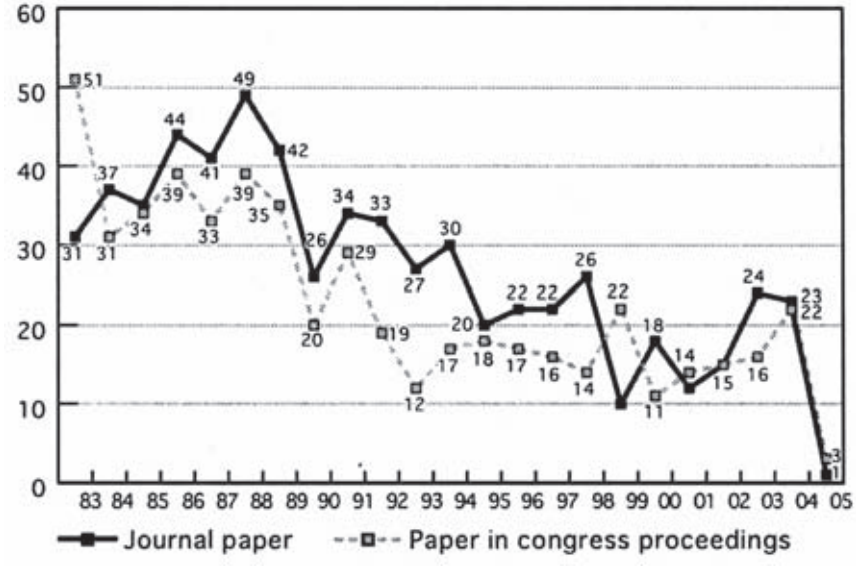


Fig. 4 – Number of hemorheological papers in japanese journals and congress proceedings

As a result, it was a source including the research fund, talent, and the education, etc.

Moreover, the research paper output is useful for the science policy in each country comparative study as the competency of specific laboratories and the factor of the evaluation of research revitalization degree.

Evaluation of Research Revitalization

Anyway, it could be utilized as the ranking evaluation of the material by assuming bibliometric activity to be an important objective criterion of the research revitalization degree : it was about each part of the self-evaluation or the university.

Paper Output of Blood Rheology

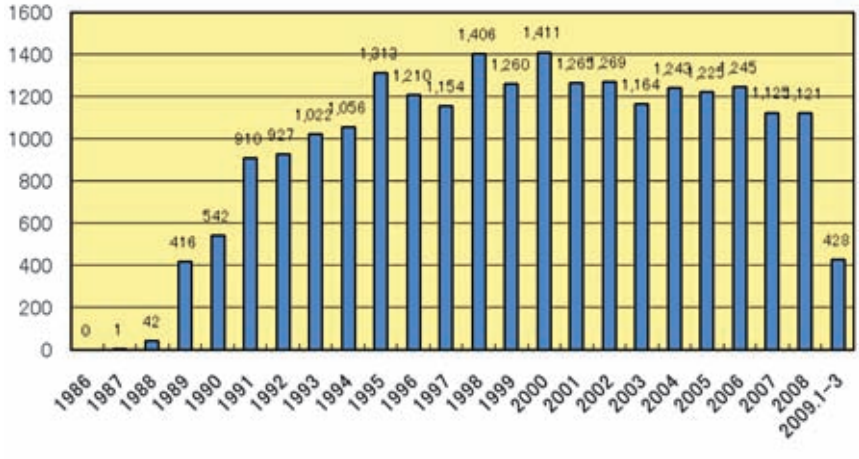
Table 1 has shown the change of the time series of the paper output of the blood rheology for 60 years, and was what of the disease and the diabetes connected to an item related to the blood rheology compared according to the categories mentioned above (I, II and III).

In 1958-1961, it was that the papers of "Blood viscosity and the related articles" had showed an increase. It was the age when plastic spouting, manufacturing on a practical side and the process in line with there was an age when the highly developed polymer chemistry, which was close related with the rheology development, and the biorheology faced a prosperous period in its background.

The first international journal of Biorheology volume 1 issued in 1962 was published by the Pergamon Press, in England. The editors-in--chiefs were Alfred L Copley and George Scott Blair.

The 1st International Conference on Hemorheology (ICH) was held in Reykjavik, Iceland in July, 1966. As for the research of the blood rheology, these events caught attention and absorbed interest of researchers, and the research of the field became active.

The above-mentioned international hemorheology conference changed the name on the occasion of holding the 1st International Biorheology Congress in the meeting of the 3rd ICH in Lyon, France in September, 1972, and came to encompass the entire science of Biorheology besides the blood rheology.



Yrs	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
No	**0**	**1**	**42**	**416**	**542**	**910**	**927**	**1022**	**1056**	**1313**	**1210**	**1154**
Yrs	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
No	**1406**	**1260**	**1411**	**1265**	**1269**	**1164**	**1243**	**1225**	**1245**	**1125**	**1121**	**428**

Fig. 5 – The transition of output on "Endothelin" papers

The 1st European Conference on Clinical Hemorheology was held in Nancy, France in October, 1979[3]. The rise of concern to the clinical blood rheology and related pharmacology were increased.

The first volume 1 issue of the Clinical Hemorheology was published as Biorheology sisters international journal in 1981. The editors-in--chief were Alfred L Copley and Siegfried Witte.

Transition of Paper Output

As for the movement of "Blood viscosity and related articles", the paper production had increased rapidly around 1978-1981. Figure 1 showed the change of time series of the number of papers in the graph. It was thought that the 3 factors of ① the establishment of the clinical blood rheology society (European Clinical Hemorheology Society), ② the regular science meeting, ③ the Clinical Hemorheology (CH) journal publication ,contributed to the research stimulation and the increase of the research paper production. However, it was after 1997 the contents of the CH journal were recorded in Medline.

Therefore, it seemed that the CH papers were published in other journals until that time.

Movement, according to the category (I, II and III), showed the similar abbreviation change, and special movement was not seen in "Papers concerning the diabetes" output in Fig. 1.

Table II was the one that the authors had examined the number of documents of "Viscosity of blood" related to clinical for 12 years from 1972 to Mar., 1983. We want to pay attention to a lot of numbers of papers regarding the effects of the medical drugs, the paraproteinemia (especially serum hyperviscosity syndrome), the ischemic heart disease, and diabetes.

There were a lot of research papers concerning the effects of the medical drugs for the improvement of microcirculation and red cell deformability. Also it seemed that there were movement of the development of new medical drugs in the view point of blood rheology and of the implications. Moreover, the paraproteinemia came in succession at the time when serum hyperviscosity syndrome became a centering topic of the clinical blood rheology. These were suggested the background in the age, were the stimulation of the paper production on the research topics.

L. Bogar investigated the number of documents by Medline about "Blood and plasma viscosity" of the blood rheology factors and clinical researches until 1966-1997. It was described that a decrease was seen afterwards, and announced the result similar to authors' Figures 1 though the number of papers traced an increase until the latter half of the 1980's[4].

Paper Output in Various Countries

The contributed trend was examined the output of blood rheology papers classified in countries. In Table III, it has been understood that the United States, Britain, Germany, the former Soviet Union, and Russia

were greatly taking part in the paper production. Japan had a lot of numbers which were the first authors after the United States.

Fig. 4 showed the number of clinical blood rheology papers that were able to be put within Japan.

Anyway, an increase until achieving the research target and a decrease after that was assumed as for paper production.

The limit will gradually come into view to the production of papers concerned as long as abundant replenishment support of the sprout or research personnel of a relating modern research topic is not appeared.

In general, the subject of a specific research was formed when the interest of a related area rose if the announcement of the research topic newly paid attention to do and depth came out.

As one example (Fig. 5), the transition of the number of paper of endothelins (ET) (strong vasoconstrictor peptide isolated from the culture supernatant of the culture pig aorta vascular endothelial cell by Mazaki *et al.* 1998) in the vascular biology illustrated in figure and table.

The kind of the endothelin, its precursor and the appearance in cells, and the ET production lived with the cytokine got into the news in recent years, and the paper output seemed the exponential grow at the same time for discovering it.

In similar case, for instance, the paper output has showed an increase in vessel biology including biorheology, the reproduction medicine, and gene therapy, etc.

CONCLUSION

When the research target is subdivided , however, and the result rises, the paper output before long will limit and the expectation by which the acceleration becomes duller. On the other hand, the quality of the paper seems to rise even if the number of paper decreases.

At the end of the paper, authors hope the development of research and increase the paper production as there are unsettled topics a lot in the blood rheology.

ACKNOWLEDGMENTS

We thank Mrs. Keiko Kusumoto, for her help with manuscript preparation.

BIBLIOGRAPHY

1. Shinichi Abe, and Mari Okude, Illustration : How to use PuMed and : to look for medical paper on the Internet, pp. 2-10, The 2nd edition, Japan Medical Library Association, 2003.
2. Masamitsu Negishi and Shigeaki Yamazaki ed. Guideline at research evaluation-researcher, research institutes and university, pp. 19-28, Maruzen Co., Ltd., 2003.
3. Biorheology – What is biorheology? In commemoration of the 8th International Congress of Biorhology, August 3-8, 1992, Yokohama-Japan, eds, Y. Isogai, K. Kusumoto and R. Arizuka, 1993. pp. 1-62.
4. L. Bogar Medline search for identifying clinical trial in hemorheology, Biorheology 36, Abstracts of 10th ICB and 3rd ICCH. Hungary. Pecs1999, p. 197
5. Japana Centra Revuo Medicina (in Japanese : Igaku Chuo Zasshi, since 1903).

BEHAVIOUR OF THE ERYTHROCYTE DEFORMABILITY AND NITRIC OXIDE METABOLITES IN UNPROFESSIONAL ATHLETES / COMPORTAMENTO DA DEFORMABILIDADE ERITROCITÁRIA E DE METABOLISMOS DO MONÓXIDO DE AZOTO EM ATLETAS AMADORES

Gregorio Caimi, Baldassare Canino, Rosalia Lo Presti

ABSTRACT

We examined, in 81 athletes subdivided into three groups according to the practised sport (endurance, mixed, power), erythrocyte deformability and nitric oxide metabolites (NOx). In the whole group and in athletes that practised endurance and mixed sports we observed, in comparison with sedentary controls, an increase in erythrocyte deformability. In the same groups we found an increase in plasma NOx level although we did not note any significant correlation between these parameters.

Physical training induces significant effects on the haemorheological pattern[1] of which the major components are haematocrit, plasma viscosity, red cell aggregation and deformability. Each of these rheological parameters acts in a specific area of the circulatory system in relation to the velocity gradient and so pointing out the strong link between non-newtonian blood viscosity and haemodynamic profile.

Red cell deformability, that together with plasma viscosity plays a pivotal role in the microcirculation, physiologically depends on the surface-volume ratio, internal viscosity and membrane dynamic properties but also by pH, osmolarity, mechanical factors and nitric oxide (NO). The influence of NO on red cell deformability is related to dose[2,3] and partly dependent on guanylate cyclase activity[4]; its influence is significantly reduced by the employment of NO synthesis inhibitors[4,5].

Up to now the literature data show that in several sports at rest an increase of red cell deformability has

Dipartimento di Medicina Interna, Malattie Cardiovascolari e Nefrourologiche
Università di Palermo
Italy

Corresponding author:
Prof. Gregorio Caimi
Via Leonardo da Vinci, 52
90145 Palermo, Italy
Fax: +39 91 6554535
e-mail: caimigre@unipa.it

been observed in comparison with sedentary controls[6-12] as well as in athletes a greater percentage of younger cellular elements has been found[9,10,13]. On the other hand the exercise training causes a significant increase in NO production[14-17].

Considering these aspects we examined erythrocyte deformability and NO metabolites (NO_2^- + NO_3^- = NOx) in 81 athletes (55 men and 26 women; mean age 31.5 ± 8.7 years) subdivided into 3 subgroups. The first group included 28 subjects (23 men and 5 women; mean age 35.9 ± 10.0 years) who practised endurance sports (14 cyclists, 14 endurance swimmers). The second group included 30 subjects (20 men and 10 women; mean age 28.5 ± 7.8 years) who practised mixed sports (11 basket players, 10 judoists, 9 water polo players). The third group included 23 subjects (19 men and 4 women; mean age 30.6 ± 6.1 years) who practised power sports (4 sprint runners, 5 weightlifters, 14 sprint swimmers).

The control group included 27 healthy sedentary subjects (20 men and 7 women; mean age 33.2 ± 5.6 years).

The erythrocyte deformability was examined using the diffractometer Rheodyn SSD of Myrenne[18,19]. This instrument measures the diffraction pattern of a laser beam passing through erythrocytes suspended in a viscous medium and deformed by a force with defined shear stresses. A measure of erythrocyte deformation is the Elongation Index (EI) = (L-W)/(L+W)×100, where L = length and W = width of the erythrocytes. We considered the EI at the shear stress of 60 Pascal (Pa).

The NO production was evaluated by a micromethod which measures the concentration of both NO metabolites (nitrite plus nitrate). At first nitrate was converted into nitrite by a nitrate reductase, then nitrite was assessed by spectrophotometry after addition of the Griess reagent[20].

The values were expressed as means ± standard deviation. The difference between sedentary controls and athletes was evaluated according to the Student's t test for unpaired data.

Erythrocyte deformability, expressed as EI, was significantly increased in athletes (Controls: 43.85 ± 4.48; Athletes: 47.21 ± 4.46; $p < 0.01$). Subdividing the whole group of athletes into three subgroups according to the practised sport, we noted (Fig. 1) in the endurance athletes an increase in erythrocyte deformability (EI: 46.98 ± 4.03; $p < 0.05$ vs controls); the same behaviour was even more evident in the mixed athletes (EI: 49.52 ± 3.42; $p < 0.001$ vs controls) while in the power athletes no difference was evident in comparison with control subjects (EI: 44.45 ± 4.66).

The evaluation of NOx showed an increase in the whole group of athletes (controls: 26.67 ± 18.63 micromol/l; Athletes: 41.16 ± 24.87 micromol/l; $p < 0.01$); this increase (Fig. 2) was statistically significant only in endurance and mixed athletes (endurance athletes: 43.01 ± 23.08 micromol/l; $p < 0.01$ vs controls; mixed athletes: 45.85 ± 30.63 micromol/l; $p < 0.01$ vs controls) and not in power athletes (33.00 ± 16.45).

From the obtained data it was evident that erythrocyte deformability, at rest, distinguished sedentary controls only from athletes that prac-

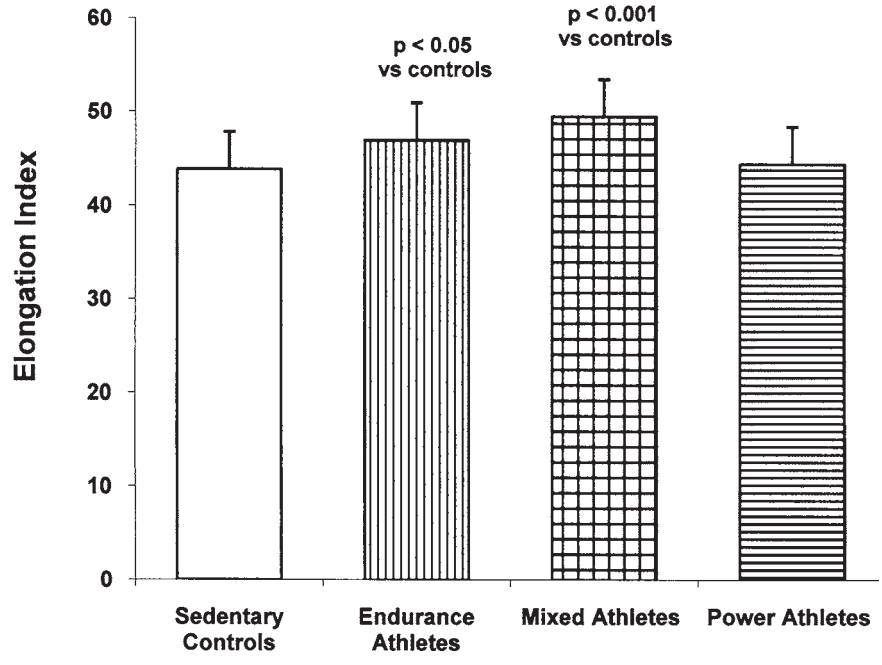


Fig. 1 – Erythrocyte deformability, expressed as elongation index, in sedentary controls and in the three subgroups of athletes

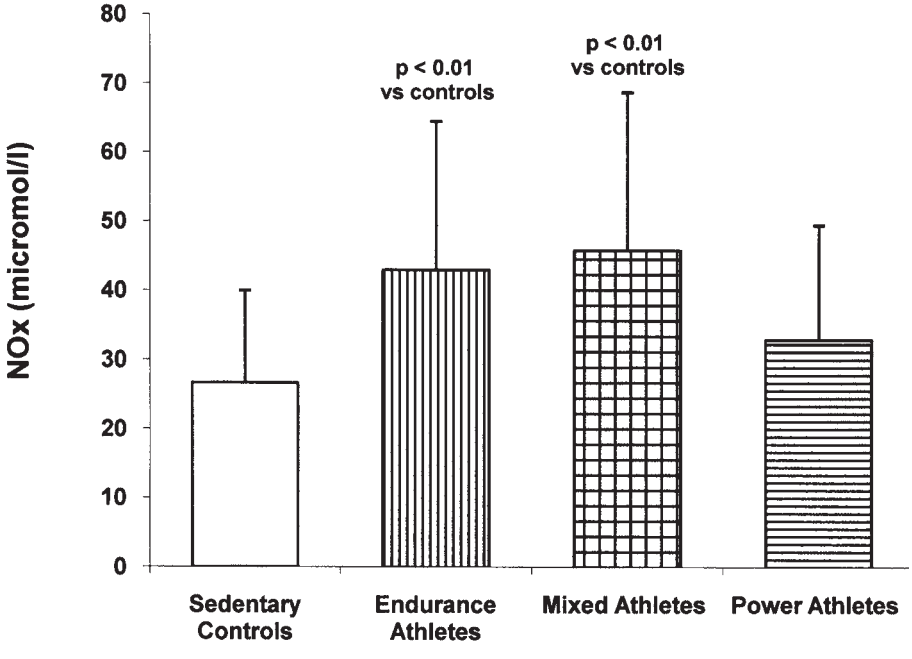


Fig. 2 – Nitric oxide metabolites (NOx) in sedentary controls and in the three subgroups of athletes

tised aerobic and mixed sports. Also a NOx increase was present in these groups of athletes, although we did not find, using linear regression, any correlation between NOx values and elongation index. Our observations confirm several findings concerning the behaviour of erythrocyte deformability found in athletes[6-12], also considering that, in athletes who practise

power sports, the erythrocyte turnover is not particularly accelerated, differently from endurance athletes[21]. Our data also underline the role of training on the NOx level. The datum in fact confirms the strong link between exercise and endothelium and in particular how regular exercise seems to upregulate eNOS expression, even if up to now it is not sure if this upregularion is due to the shear stress or metabolic factors[17].

In conclusion, these data show that in athletes that practise aerobic and mixed sports the increase of NOx plasma level is accompanied by an increase of erythrocyte deformability; the latter, as it is known, plays a pivotal role in the microcirculation system and influences the tissue oxygen transport. These results may contribute to explain the significant role of the aerobic exercise in the cardiovascular prevention.

BIBLIOGRAPHY

1. Marton Z, Toth K. Exercise and hemorheology. In: Baskurt OK, Hardeman MR, Rampling MW, Meiselman HJ (Eds.). Handbook of hemorheology and hemodynamics. Amsterdam: IOS Press, 2007:422.
2. Kleinbongard P, Schulz R, Rassaf T, *et al.* Red blood cells express a functional endothelial nitric oxide synthase. Blood 2006; 107:2943.
3. Carvalho FA, Maria AV, Braz Nogueira JM, *et al.* The relation between the erythrocyte nitric oxide and hemorheological parameters. Clin Hemorheol Microcirc 2006; 35:341.
4. Bor-Kucukatay M, Wenby RB, Meiselman HJ, Baskurt OK. Effects of nitric oxide on red blood cell deformability. Am J Physiol 2003; 284: H1577.
5. Bor-Kucukatay M, Meiselman HJ, Baskurt OK. Modulation of density-fractionated RBC deformability by nitric oxide. Clin Hemorheol Microcirc 2005; 33:363.
6. Ernst E, Weihmayr T, Schmid M, *et al.* Cardiovascular risk factors and hemorheology. Physical fitness, stress and obesity. Atherosclerosis 1986; 59:263.
7. Wood SC, Doyle MP, Appenzeller O. Effects of endurance training and long distance running on blood viscosity. Med Sci Sports Exerc 1991; 23:1265.
8. Kamada T, Tokuda S, Aozaki S, Otsuji S. Higher levels of erythrocyte membrane fluidity in sprinters and long-distance runners. J Appl Physiol 1993; 74:354.
9. Smith JA, Martin DT, Telford RD, Ballas SK. Greater erythrocyte deformability in world-class endurance athletes. Am J Physiol 1999; 276: H2188.
10. Nakano T, Wada Y, Matsumura S. Membrane lipid components associated with increased filterability of erythrocytes from long-distance runners. Clin Hemorheol Microcirc 2001; 24:85.
11. Cazzola R, Russo-Volpe S, Cervato G, Cestaro B. Biochemical assessments of oxidative stress, erythrocyte membrane fluidity and antioxidant status in professional soccer players and sedentary controls. Eur J Clin Invest 2003; 33:924.
12. Melnikov AA, Vikulov AD, Bagrakova SV. Relationships between von Willebrand factor and hemorheology in sportsmen. Clin Hemorheol Microcirc 2003; 29:19.
13. Muravyov AV, Draygin SV, Eremin NN, Muravyov AA. The microrheological behavior of young and old red blood cells in athletes. Clin Hemorheol Microcirc 2002; 26:183.
14. Maeda S, Miyauchi T, Kakiyama T, *et al.* Effects of exercise training of 8 weeks and detraining on plasma levels of endothelium-derived factors, endothelin-1 and nitric oxide, in healthy young humans. Life Sci 2001; 69:1005.
15. Maeda S, Tanabe T, Otsuki T, *et al.* Moderate regular exercise increases basal production of nitric oxide in elderly women. Hypertens Res 2004; 27:947.
16. Franzoni F, Galetta F, Morizzo C, *et al.* Effects of age and physical fitness on microcirculatory function. Clin Sci 2004; 106:329.
17. Haram PM, Kemi OJ, Wisloff U. Adaptation of endothelium to exercise training: insights from experimental studies. Front Biosci 2008;13:336.
18. Ruef P, Pöschl JMB, Linderkamp O, Schmid-Schönbein H. The shear stress diffractometer Rheodyn SSD for determination of erythrocyte deformability. II. Sensitivity to detect abnormal erythrocyte deformability. Clin Hemorheol 1996; 16:749.
19. Schmid-Schönbein H, Ruef P, Linderkamp O. The shear stress diffractometer Rheodyn SSD for determination of erythrocyte deformability. I. Principles of operation and reproducibility. Clin Hemorheol 1996; 16:745.
20. Nims RW, Darbyshire JF, Saavedra JE, *et al.* Colorimetric methods for the determination of nitric oxide concentration in neutral aqueous solutions. Methods 1995; 7:48.
21. Beneke R, Bihn D, Hutler M, Leithauser RM. Haemolysis caused by alterations of alpha- and beta-spectrin after 10 to 35 min of severe exercise. Eur J Appl Physiol 2005; 95:307.

NUMERICAL SIMULATION OF BLOOD FLOW THROUGH MICROVASCULAR CAPILLARY NETWORKS

(ARTIGO ORIGINAL)

Pozrikidis C.

A numerical method is implemented for computing blood flow through a branching microvascular capillary network. The simulations follow the motion of individual red blood cells as they enter the network from an arterial entrance point with a specified tube hematocrit, while simultaneously updating the nodal capillary pressures. Poiseuille's law is used to describe flow in the capillary segments with an effective viscosity that depends on the number of cells residing inside each segment. The relative apparent viscosity is available from previous computational studies of individual red blood cell motion. Simulations are performed for a tree-like capillary network consisting of bifurcating segments. The results reveal that the probability of directional cell motion at a bifurcation (phase separation) may have an important effect on the statistical measures of the cell residence time and scattering of the tube hematocrit across the network. Blood cells act as regulators of the flow rate through the network branches by increasing the effective viscosity when the flow rate is high and decreasing the effective viscosity when the flow rate is low. Comparison with simulations based on conventional models of blood flow regarded as a continuum indicates that the latter underestimates the variance of the hematocrit across the vascular tree. **[Bull Math Biol 2009; 71(6):1520-1541]**

PMID: 19267162

PECULIAR FLOW PATTERNS OF RBCS SUSPENDED IN VISCOUS FLUIDS AND PERFUSED THROUGH A NARROW TUBE (25 MICROM)

(ARTIGO ORIGINAL)

Sakai H, Sato A, Okuda N, Takeoka S, Maeda N, Tsuchida E.

Red blood cells (RBCs) generally deform to adopt a parachute-like, torpedo-like, or other configuration to align and flow through a capillary that is narrower than their major axis. As described herein, even in a narrow tube (25 microm) with diameter much larger than that of a capillary, flowing RBCs at 1 mm/s align axially and deform to a paraboloid shape in a viscous Newtonian fluid (505 kDa dextran medium) with viscosity of 23.4-57.1 mPa.s. A high-speed digital camera image showed that the silhouette of the tip of RBCs fits a parabola, unlike the shape of RBCs in capillaries, because of the longer distance of the RBC-free layer between the tube wall and the RBC surface (approximately 8.8 microm). However, when RBCs are suspended in a "non-Newtonian" viscous fluid (liposome-40 kDa dextran medium) with a shear-thinning profile, they migrate toward the tube wall to avoid the axial lining, as "near-wall-excess," which is usually observed for platelets. This migration results from the presence of flocculated liposomes at the tube center. In contrast, such near-wall excess was not observed when RBCs were suspended in a nearly Newtonian liposome-albumin medium. Such unusual flow patterns of RBCs would be explainable by the principle; a larger particle tends to flow near the centerline, and a small one tends to go to the wall to flow with least resistance. However, we visualized for the first time the complete axial aligning and near-wall excess of RBCs in the non-capillary size tube in some extreme conditions. **[Am J Physiol Heart Circ Physiol 2009; 297(2):H583-589]**

PMID: 19502557

VENOUS THROMBOEMBOLIC EVENTS IN HOSPITALIZED MEDICAL PATIENTS
(ARTIGO ORIGINAL)

Piazza G, Fanikos J, Zayaruzny M, Goldhaber SZ

The number of acutely ill hospitalised medical patients at risk for acute venous thromboembolism (VTE) has not been well defined. Therefore, we used the 2003 United States Healthcare Cost and Utilization Project (HCUP) Nationwide Inpatient Sample database to estimate VTE events among hospitalised medical patients. We then modeled the potential reduction in VTE with universal utilisation of appropriate pharmacological thromboprophylaxis. We calculated that 8,077,919 acutely ill hospitalised medical patients were at risk for VTE. Heart failure, respiratory failure, pneumonia, and cancer were the most common medical diagnoses. We estimated that 196,134 VTE-related events occurred in 2003, afflicting two out of every 100 acutely ill hospitalised medical patients. These VTE-related events were comprised of 122,235 symptomatic deep venous thromboses, 32,654 symptomatic episodes of pulmonary embolism, and 41,245 deaths due to VTE. In our model, rates of pharmacological thromboprophylaxis prescription were low for various acute medical illnesses, ranging from 15.3% to 49.2%. However, with universal thromboprophylaxis, 114,174 VTE-related events would have been prevented. In conclusion, acutely ill medical patients represent a large population vulnerable to the development of VTE during hospitalisation. The number of VTE-related events would be halved with universal thromboprophylaxis. Further efforts focused on improving VTE prevention strategies in hospitalised medical patients are warranted. **[Thromb Haemost 2009; 102(3):505-510]**

PMID: 19718471

IMAGES IN CLINICAL MEDICINE. LEUKOCYTOSIS AND SUBLINGUAL MICROVASCULAR BLOOD FLOW

N Engl J Med 2009; 360(7):E9

Meinders AJ, Elbers P

APRESENTAÇÃO

A 51-year-old woman presented with a 3-month history of fatigue and a 2-week history of a nonproductive cough and night sweats. Chronic myeloid leukemia was diagnosed, with a leukocyte count of 398 000 per cubic millimeter.

(Ver todo o texto em: http://content.nejm.org/cgi/content/extract/360/7/e9)

CHEST PAIN AND SMALL RED CELLS: SIZE DOES MATTER

Lancet 2009; 374:426

Tauro S, Hutcheon S

APRESENTAÇÃO

A 63-year-old woman was admitted to our hospital in June, 2008, with a 24-h history of central chest pain radiating to her neck. In the 7 days before admission, she had experienced intermittent chest tightness without any obvious precipitating cause. Her medical history was unremarkable. She did not smoke and was on no regular medication. There were no abnormalities on clinical examination. ECG showed inversion of T waves in leads III, V2, and V3. Serum troponin T concentration after 12 h was 1·22 μg/L (normal range [NR] 0–0·01 μg/L) indicating an inferior non-ST-elevation myocardial infarction.

(Ver todo o texto em: http://www.thelancet.com/search/results?searchTerm=tauro&fieldName=AllFields&year=2009&volume=&page=&journalFromWhichSearchStarted=)

NOVOS MEMBROS DO CONSELHO EDITORIAL INTERNACIONAL

Junto apresentamos o Resumo curricular e fotografia dos novos membros do Conselho Editorial Internacional do Boletim da SPHM:

Professor Yukihide Isogai

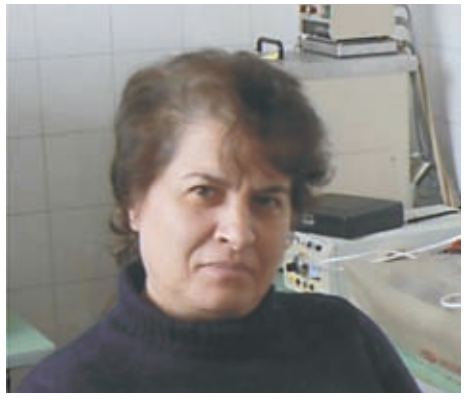
YUKIHIDE ISOGAI, physician, hematologist, diabetologist, clinical hemorheology researcher, b. Tokyo. July, 30, 1929. MD. Jikei Med. Sch. 1955, PhD, 1960., 1983-95,prof. med,1995,vis.prof .Physician Clinic for Hematology and Diabetology, Jikei U. Hosp. and Consultant, Kinugasa Gen. Hospital. Editor: Clinical-Hemorheo. and microcirculation, 1981, Biorheology (Japan) 1981. Med. Rsch. grantee: Sankyo Life Sci. Tokyo, 1984-85, Chyoda Nutural Life Found, Tokyo, 1933, Disting. Investigator award Japanese (Soc.Diabetic Complication), Syoten Oka award,2004 (Japa. Soc. Biorhe.), Poiseuille Gold Medal award,2005 (Int. Soc. Biorheo.). Mem. Int. Soc. Biorheo. (chmn. 1992: 8th Int. Cong. Biorhe. Yokohama Japn.), pres.1992-95, pastpres, 1995-99),WorldSoc.Biomechanics (coun. mem 1990-98) Japn. Soc. Microcirc. (mem. of merit), Potugal Soc.Hemorheoly (hon).

Professor Geert W. Schmid-Schoenbein

Geert W. Schmid-Schoenbein is Distinguished Professor and Director of the Microcirculation Laboratory in the Department of Bioengineering at UCSD. He received his Ph.D. degree in Bioengineering at UCSD. After three years as Post-doctoral Fellow in the Department of Physiology of Columbia University, New York, he

joined the faculty of the Department of Bioengineering at UCSD in 1979 where he has served ever since. He teaches bioengineering of living tissues and biomechanics and has been nominated repeatedly as Teacher of the Year in Bioengineering at UCSD. He is member of many learned Societies in Engineering and in Medicine, Founding Member of AIMBE, former President of the Biomedical Engineering Society, the Microcirculatory Society and the North American Society of Biorheology, Fellow of the American Heart Association and the International Federation for Medical and Biological Engineering, and Member of the National Academy of Engineering. He is the 2008 Landis Award winner and recipient of the Outstanding Educator Award in the National Engineering Week 2009. He has published over 320 original peer-reviewed research reports and several books. His team has recently discovered a previously unknown mechanism for disease due to "Autodigestion" and they proposed a new mechanism for Type II Diabetes.

Professora Nadia Antonova



Nadia Antonova is educated in Sofia University St. Kl. Ohridski, Sofia, Bulgaria, Faculty of Mathematics and Mechanics, Fluid Mechanics, magister of mechanics, 1978.She completed in 1985 a PhD Thesis on Mechanical Properties of Blood in the Department of Biomechanics of Cardiovascular System in the Intitute of Mechanics and Biomechanics to the Bulgarian Academy of Sciences. Since 1999 she is Associate Research Professor in the Department of Biodynamics and Biorheology. Her scientific inerests are in the field of hemorheology, biorheology, electrorheology, biorheological data processing, lung surfactant, clinical applications. She was a Vice President of the European Society for Clinical Hemorheology and Microcirculation (ESCHM) and since 2009 she was elected for the President of the ESCHM. She was a President of the 12th European Conference on Clinical Hemorheology and Microcirculation and the Bulgarian Society of Biorheology organised three Eurosummer Schools on Biorheology in Bulgaria. She is a President of Bulgarian Society of Biorheology and Secretary of the Section Mechanics to the Union of Bulgarian Scientists For the last several years she and her co-authors have published about 60 papers in different journals. She has PhD and Master students finished their degree under her supervision.

Professor Oguz K. Baskurt

Oguz K. Baskurt is a medical physiologist, currently working as a professor at Akdeniz University, Antalya, Turkey. His research is focused on the rhelological properties of blood and their physiological significance starting with his PhD work. A strong collaboration with Dr. Baskurt and Prof. Herbert J. Meiselman has started in 1995, when Dr. Baskurt spent a year in his laboratory in Los Angeles. This collaboration resulted in an extensive research activity mostly in the fields of red blood cell aggregation, comparative hemorheology and in vivo hemorheology. Dr. Baskurt published about 150 papers, mostly in international, peer-reviewed journals and edited a book entitled Handbook of Hemorheology and Hemodynamics. He was the president of the International Society for Clinical Hemorheology between 1999-2005. He serves in the editorial board of several international journal.

Doutor Jean-Frédéric Brun

Jean-Frédéric Brun, Née a 6 Février 1956, Docteur en Médecine – Juin 1980 – (prix de thèse palmarès 1980). Doctorat de Physiologie, Université de Montpellier I. Octobre 1988. Rapporteurs: professeurs PJ Lefèbvre (Liège) et R Flandrois (Lyon).

Praticien Hospitalier non chef de Service. Discipline : Physiologie et Explorations Fonctionnelles, Exploration Métabolique et Endocrinienne, Physiologie de l'Exercice Physique, Hémorhéologie. Spécialiste Endocrinologie et Maladies Métaboliques (Diplome Janvier 1984).Certificat d'Université des Maladies du Sein (Février 1983).CES Biologie et Médecine du Sport (Octobre 1986).DEA "Activités Physiques et Sportives et Développement Psychologique et Moteur" option "Physiologie de l'Exercice Musculaire et Physiopathologie Neuro-musculaire" Décembre 1986. Université de Montpellier I. Habilitation à diriger des Recherches en Physiologie (Juin 1997)

Address : INSERM ERI 25 Muscle et Pathologies, Service Central de Physiologie Clinique, Centre d'Exploration et de Réadaptation des Anomalies du Métabolisme Musculaire (CERAMM), CHU Lapeyronie, 34295 Montpellier cedex 5, France.

E-Mail : drjfbrun@dixinetcom

RELATÓRIO DO CURSO EUROPEU DE VERÃO EM BOROVETS

3RD EUROSUMMER SCHOOL ON BIORHEOLOGY AND SYMPOSIUM ON MICRO AND NANOMECHANICS AND MECHANOBIOLOGY OF CELLS, TISSUES AND SYSTEMS

O "3rd EuroSummer School on Biorheology and Symposium on Micro and Nanomechanics and Mechanobiology of Cells, Tissues and Systems" ocorreu em Borovets, Bulgaria, nos dia 29 de Agosto a 2 de Setembro (Figs 1 e 2).

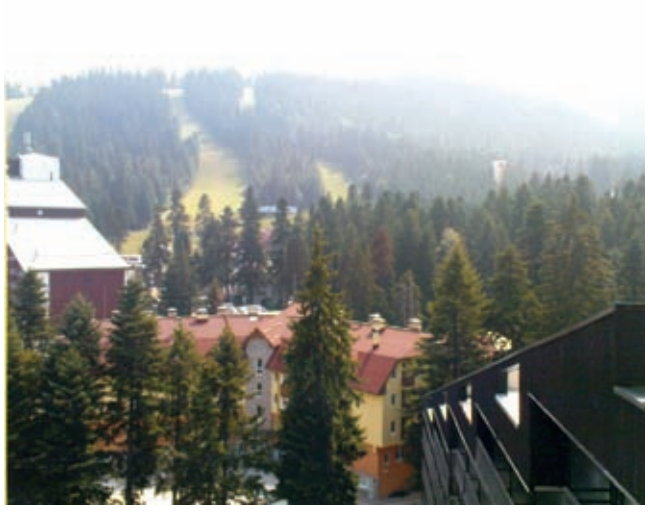


Fig. 1 – Paisagem local

Fig. 2 – Local da Reunião

A organização do evento, presidido por Nadia Antonova, resultou da parceria estabelecida entre a European Society of Clinical Hemorheology and Microcirculation e a Bulgarian Societyof Biorheology.

Foi um encontro de cientistas da Alemanha, Bielorrússia , Bulgária, França, Grécia, Guadalupe, Hungria, Israel, Itália, Jordânia Nigéria, Polónia, Portugal, Reino Unido, República Checa, Rússia, e Turquia. Esta representatividade de 18 países, traduziu-se em 17 lições plenárias, 27 comunicações e 21 Posters.

A presidente da Sociedade Portuguesa de Hemorreologia e Microcirculação, teve intensa intervenção nomeadamente proferiu a lição plenária "Erythrocyte Deformability Responses to Shear Stress under External and Internal Stimuli Influences" que também co-moderou um dos Simpósios intitulado "Cell Interaction and Adhesion".

Durante estes dias novas parcerias científicas surgiram e oportunidades de ligações e formação de redes de projectos se iniciaram entre os participantes.

Para o êxito destas oportunidades muito contribuiu a localização do evento num aldeamento"resort" de Inverno de Borovets. Se folhearem as páginas de da Internet terão oportunidade de se maravilharem com a paisagem.

RELATÓRIO DO NOVO PRESIDENTE DA SOCIEDADE EUROPEIA DE HEMORREOLOGIA CLÍNICA E MICROCIRCULAÇÃO, PROFESSORA NADIA ANTONOVA

The 15th Conferences of the European Society of Clinical Hemorheology and Microcirculation (ESCHM) in Pontresina/St. Moritz, Switzerland (June 28th – July 1st, 2009), organized by Prof. Walter H. Reinhart, MD,was full of valuable scientific contributions (http://www.congress-info.ch/eschm2009): plenary lectures by Sandro Forconi, Shu Chien, Tommaso Gori, Herb Meiselman, Gerard Nash, the Fahraeus award lecture, and a special lecture on high altitude physiology by Peter Bärtsch from the University of Heidelberg, accompa and poster sessions covering the whole field of Hemorheology and Microcirculation. During the Pontresina meeting Prof. Friedrich Jung from Dresden, Germany has been honored with the Fahraeus Medal Award and the Laudatio has been given by Dr. Mike Rampling (London) – the Fahraeus Medal Award winner from the Dresden Conference. The Conference report about the Pontresina meeting has just been published in J. Applied Rheology by Prof. W. Reinhart. All the acts and the decisions regarding the Society has been and will be shared on the web site of the ESCHM, which will be regularly updated (please, take a look at it now: http://www.esch.unisi.it/) or http://www.unisi.it/ricerca/asso/esch/index.htmor simply type ESCHM with Google. From the web site you can get all the possible information regarding the activities of the ESCHM and of the last Conferences. The Pontresina Proceedings will be published in a Special Issue of Clinical Hemorheology and Microcirculation after the usual reviewing procedures. During the 15th Conference of the ESCHM a meeting of the Editorial Board of J. Clinical Hemorheology and Microcirculation and the Head of journal department Mrs. Marleen Berfelo at the IOS Press was held. The journal is well developed and its Impact factor has gone up to 1814 for 2008. We take the occasion for thanking the Editorial Staff of Clinical Hemorheology and Microcirculation at the IOS Press for their precious collaboration. During the 15th Pontresina Conference the new Council of the European Society of Clinical Hemorheology and Microcirculation has been elected: President: Dr. Nadia Antonova (Bulgaria) (President of the Bulgarian Society of Biorheology and Member of the Department of Biodynamics and Biorheology at the Institute of Mechanics and Biomechanics to the Bulgarian Academy of Sciences in Sofia).

GUIA PARA REVISORES DE ARTIGOS APRESENTADOS PARA PUBLICAÇÃO NO BOLETIM

De acordo com o que comunicado recentemente a todos os membros da SPHM, e a par da reformulação do Conselho Editorial do Boletim e inclusão de peritos estrangeiros, todos os artigos apresentados para publicação serão previamente apreciados por 1 ou 2 revisores científicos daquele Conselho. Os resultados da avaliação serão inscritos no formulário junto, para decisão final pelo Director do Boletim.

BOLETIM

SOCIEDADE PORTUGUESA DE HEMORREOLOGIA E MICROCIRCULAÇÃO

CONSELHO EDITORIAL INTERNACIONAL / INTERNATIONAL EDITORIAL BOARD

Normas para Revisores/ Reviewers Guide

PART A: ***Editorial Office Only***

SECTION I

Reviewer's Name:
E-Mail:
Manuscript Number:
Title:
Date of invoice to the Reviewer:
Date foreseen of Reviewer' s answer:

PART B: ***Reviewer Only***

SECTION II: Comments per Section of Article submitted

General comment:	
Introduction:	
Methodology*:	
Results*:	

Discussion*:	

SECTION II (Cont.)

Bibliography/References:	

***Disregard in Review Articles*

SECTION III - Please rate the following:
(1 = Excellent) (2 = Good) (3 = Fair) (4 = poor)

Originality:	
Quality:	
Clarity:	

SECTION IV – Recommendations
(*Please mark with an X and specify whereas necessary)*

Accept as submitted:	
Requires minor corrections	
Requires major revision:	
Reject :	

KINDLY SEND THIS FILE TO THE EDITOR

REGRAS DE PUBLICAÇÃO / INSTRUCTIONS TO AUTHORS

CONVITE

A Sociedade Portuguesa de Hemorreologia e Microcirculação (SPHM) aceita para publicação no seu BOLETIM artigos de curta extensão. O Boletim é editado quatro vezes por ano em formato de papel e electrónico (www.hemorreologia.com), sendo), sendo distribuído gratuitamente aos sócios, individualidades e instituições científicas e culturais.

INSTRUÇÕES

1. Todos os textos enviados para publicação estão sujeitos a apreciação editorial e aprovação. A decisão é baseada no mérito científico e cultural dos trabalhos.

2. São aceites somente os trabalhos preparados em versão óptica (*PDF* ou *Microsoft Word*).

3. Os textos devem ser redigidos em Português ou Inglês.

4. Os manuscritos com o pedido de publicação devem ser enviados por *e-mail* ao Editor (carlotasaldanha@fm.ul.pt).

– Comunicações Originais (artigos curtos) – Os textos serão considerado para publicação rápida, com a seguinte estrutura: Sumário (50-70 palavras), Introdução, Material e Métodos, Resultados, Discussão e Conclusões. O(s) autor(es) são estimulados a englobar em conjunto os resultados, discussão e conclusões.
(Extensão máxima do texto: 5 a 6 páginas a um espaço (letra de corpo 11), incluindo figuras tabelas e quadros(e respectivas legendas),agradecimentos e até 30 referências bibliográficas).

– Artigos de Revisão – O BOLETIM terá a maior satisfação em acolher curtas revisões sobre assuntos de particular interesse, no âmbito da Hemorreologia, Microcirculação ou assuntos de âmbito médico ou de outras áreas científicas afins, que sejam submetidos directamente para publicação ou mediante convite especial do Editor.
(Extensão máxima do texto:8 a 10 páginas (letra de corpo 11) incluindo figuras, tabelas, quadros, fotos (e respectivas legendas), agradecimentos e até 60 referências bibliográficas).

INVITATION

The Portuguese Society on Hemorheology and Microcirculation (Sociedade Portuguesa de Hemorreologia e Microcirculação, SPHM) is pleased to welcome short papers for publication in its BOLETIM. This publication, in paper and online (www.hemorreologia.com), is distributed four times a year free of charge to the members of the Society.

INSTRUCTIONS

1. All submitted manuscripts are subjected to editorial review and approval. The decision to publish is dependent on the scientific and cultural merit of the papers.

2. Only contributions prepared and submitted as optic version (*PDF* or *Microsoft Word*), will be accepted.

3. Texts must be written in Portuguese or in English.

4. All scientific contributions, including manuscript submission and further correspondence should be addressed by *email* to the Editor (carlotasaldanha@fm.ul.pt)

– Original Communications – Manuscripts may be considered for rapid processing as short communications. All manuscripts should be arranged in the following sections: Abstract (50-70 words), Introduction, Material and Methods, Results, Discussion, Acknowledgements and References. The author(s) may combine some of the sections normally included in a full paper, namely the results, discussion and conclusions.
(Maximum communication length – 5-6 single spaced typed pages, including figures, tables, legends, acknowledgments and up to 30 references).

– Short Reviews – The BOLETIM will publish reviews on subjects of particular interest in its field, either following a special invitation or a submission by the author, and in the latter case only after approval by an Editorial Board member. Further information can be obtained from the editor.
(Maximum review length – 8-10 full pages, including figures, tables, photos, legends, acknowledgments and up to 60 references)