
ZAHRANIČNÍ PŘÍSPĚVKY

COST ASSESSMENT AND EXAMPLE APPROACH TO DEEP VENOUS THROMBOSIS TREATMENT

¹Tzvetan KREMENSKI, ¹Kuzman GIROV, ²Assen PETKOV, ³Ilko GETOV

¹Clinic of Vascular Surgery and Angiology, Military Medical Academy, Sofia

²Department of Organisation and Tactics of Medical Service, Military Medical Academy, Sofia

³Department of Social Pharmacy, Faculty of Pharmacy, Medical University, Sofia

Summary

The authors provide an overview of the social significance of the deep venous thrombosis (DVT) and large funds from both patients and health insurance organisations for the treatment.

We compared the results obtained during treatment of patients with unfractionated heparin (UFH) and low molecular weight heparin (LMWH).

The presented data and results for the cost of treatment of DVT patients require considerable financing. From the economic point of view under the conditions of health insurance it is important to increase the number of patients treated in outpatient settings.

Key words: Deep venous thrombosis; Pharmacoeconomy; Treatment algorithm.

Hodnocení nákladů a modelový přístup k léčbě hluboké venózní trombózy

Souhrn

Autoři předkládají přehled společenského významu hluboké venózní trombózy a vysokých nákladů na její léčbu jak z hlediska pacientů, tak i organizací zdravotního pojištění.

Porovnávali výsledky získané v průběhu léčby pacientů nerektifikovaným heparinem a heparinem nízkomolekulárním.

Předkládané údaje a výsledky ukazují, že léčba pacientů s hlubokou venózní trombózou vyžaduje značné finanční prostředky. Z ekonomického hlediska a za podmínek zdravotního pojištění je žádoucí, aby se zvýšil počet pacientů léčených ambulantně.

Klíčová slova: Hluboká venózní trombóza; Farmakoeconomie; Algoritmus léčby.

Introduction

Deep venous thrombosis (DVT) is a socially significant disease, which annually affects a large number of people and requires large funds from both patients and health insurance organisations. DVT is frequently a complication after surgical intervention, traumas, pregnancy, labour, neoplasms, infectious diseases and lying sick for a long time.

High morbidity is determined by changes in style and way of living of contemporary man (hypodynamics, irrational feeding, increased body weight), increased traumatism, inherited and acquired impairment of the blood clotting, increased oncological diseases, uncontrolled use of hormonal drugs, etc. Inadequate treatment leads to severe chronic

venous insufficiency of the lower extremities and to sustained disability; another real life-threat for the patients is pulmonary thromboembolism (PTE), a frequent complication of DVT (1).

Wienert's meta-analysis obtained the following results: 4 % to 17 % of the Germans are affected by DVT, up to 10 % by post-thrombotic syndrome and 1 % to 5 % by ulcers of venous origin. Patients suffering from venous insufficiency spend an annual average of over 1 million days in hospital, more than the patients with Angina pectoris. 2,111 persons are prematurely disabled by bronchial asthma, and 2,522 retire due to venous diseases. DM 1.3 billion has been spent in 1992, with anticipated growth of 50 % for the next years (14).

Data from another study show that in the lost

working days due to venous diseases are 11,000 per 100,000 inhabitants; in the Netherlands 0.6 % of the population interrupt their work for reasons of venous insufficiency for an average of 50 days per year; in France, only in the district of Gironde 250,000 working days are lost annually due to venous pathology; and in the USA the absences due to venous insufficiency of the lower extremities are 6 million working days per year (6).

Diagnosis of DVT is not difficult for general practitioners, surgeons and vascular surgeons (angiologists).

The existing therapeutic consensus includes rest and bed rest for the patient and parallel parenteral use of a direct anticoagulant in the beginning for 7–10 days. Afterwards, treatment continues with an indirect anticoagulant for 3–6 months (USA) or 6–12 months (data of Bulgarian authors) (4, 5). Simultaneously, the affected extremity should be covered by compressive-elastic bandages, whereas during the first 12 days the bandage should be worn for 24 hours and afterwards only during the active part of the day.

Therapeutic practice shows that treatment with low molecular weight heparin (LMWH) is more efficient and safer as it has considerable advantages compared to traditional treatment with unfractionated heparin (UFH).

The purpose of this study is to assess the cost of therapy of patients diagnosed with DVT and the development of an example algorithm and treatment co-ordination scheme.

Methods

Assessment of direct cost in the overall cost of treatment of patients diagnosed with DVT in Clinic of Vascular Surgery and Angiology in the Military Medical Academy for the period 1995–2002; total – 1,289 patients.

Expenses were classified in 3 groups:

Group 1 – Hospitalisation, the so-called “hotel services”;

Group 2 – Laboratory examinations - standard and specific haemostasis indices including clotting time, prothrombin index, biochemical examinations, blood group, X-ray of heart and lung, ECG, cavography, phlebography. The cost of contrast substances used for the objectification of diagnosis during phlebography and/or cavography was included.

Group 3 - Therapy. We calculated the cost of heparin (UFH and LMWH), interventional treatment (implantation of cava filter without the cost of the filter), operative treatment (veneplication or ligation), Acenocoumarol - Sintrom® 4 used for the transfer

of patients from direct to indirect anticoagulant during hospitalisation. The prices of drugs for treatment of concomitant diseases were not included (3, 12).

Cost valuation was done on the basis of Regulation No 22/97 of the Ministry of Health for the conditions and order of payment for medical care chosen by the patient (promulgated State Gazette 122/1997; amended, State Gazette 29/1998), drug wholesale prices as per “Infopharma” Bulletin and the official BGL/DEM exchange rate of the Bulgarian National Bank for the period studied.

Results and discussion

We compared the results obtained during treatment of patients with UFH and LMWH. After this therapy the patients in both groups were transferred to indirect anticoagulant if antiagregant was contraindicated.

The overall mean value and the distribution of cost by groups treated with UFH and LMWH are presented in Fig. 1 and Fig. 2. Presented data show that treatment with LMWH is less expensive but the cost ratio and structure in both cases are equal.

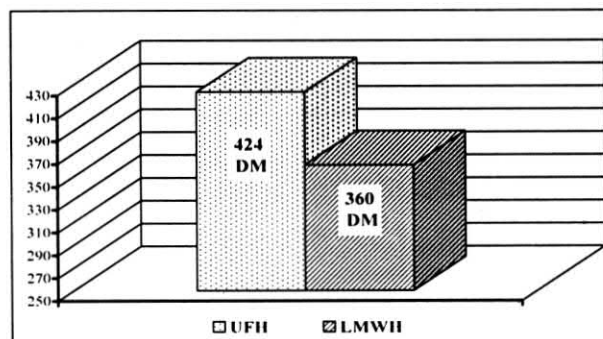


Fig. 1: Costs for treatment with UFH and LMWH (for one patient in DEM)

The price of UFH is 5–10 times lower than the price of LMWH but, despite treatment with UFH it is more expensive. The reason for that is the number of applications (3–4 times/24 h), its application only in a clinical setting, which requires permanent laboratory control. Despite raising the cost, treatment with UFH preserves its place in the DVT therapeutic scheme.

The major advantage of LMWH is the possibility to be applied in home-outpatient setting and the periodic laboratory control. After training, the patient is able to autoinject. Application is subcutaneous, 1–2/24 h, this considerably improves quality

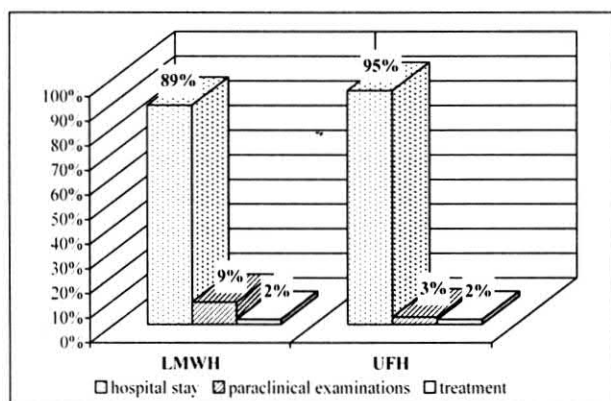


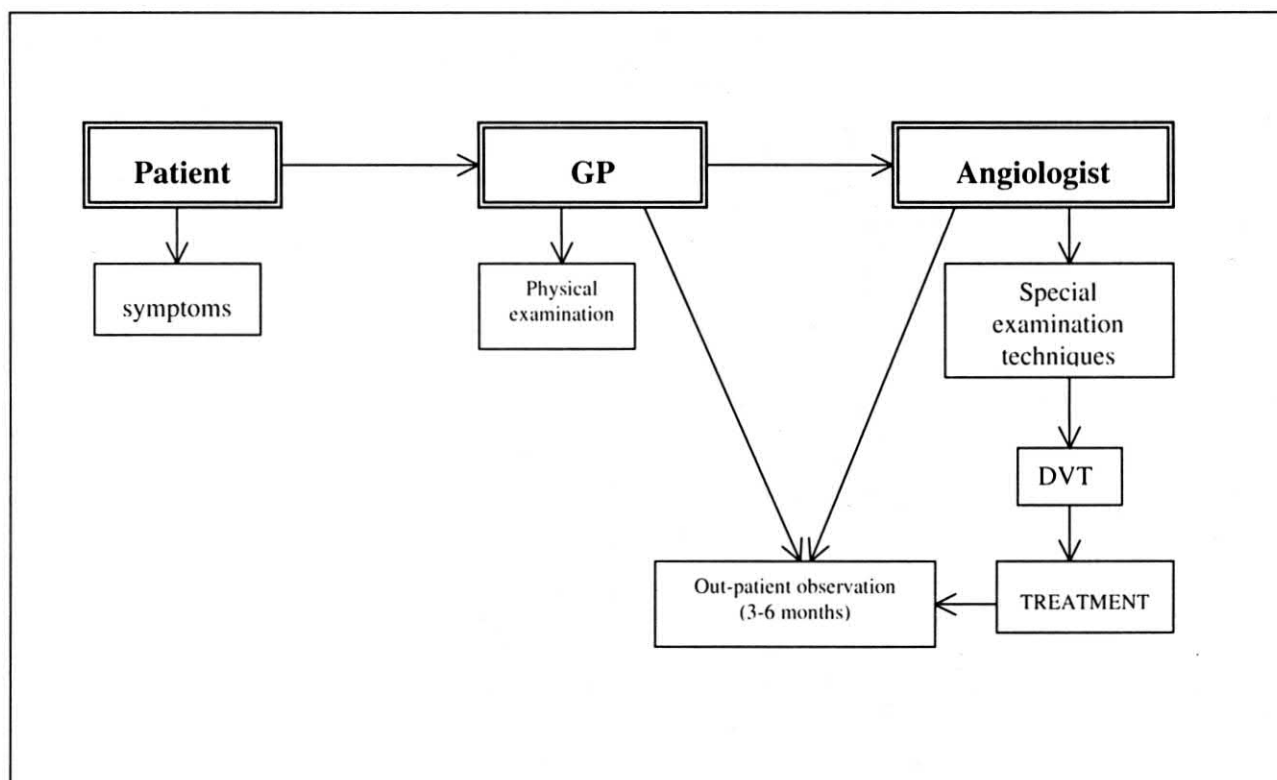
Fig. 2: Distribution of the costs for the treatment groups (in %)

of life and patient compliance. Indications and contraindications for outpatient treatment of DVT are particularly important. Summarising the practical experience gained and published data, it should be concluded that younger patients with primary uncomplicated DVT are eligible for outpatient treatment but patients aged 69+ are not eligible (10, 11, 13). Patients with concomitant conditions that require hospitalisation, patients with a history of PTE incident or serious haemorrhage and patients for whom the probability of PTE cannot be ruled out are contraindicated. Symptomatic DVT patients

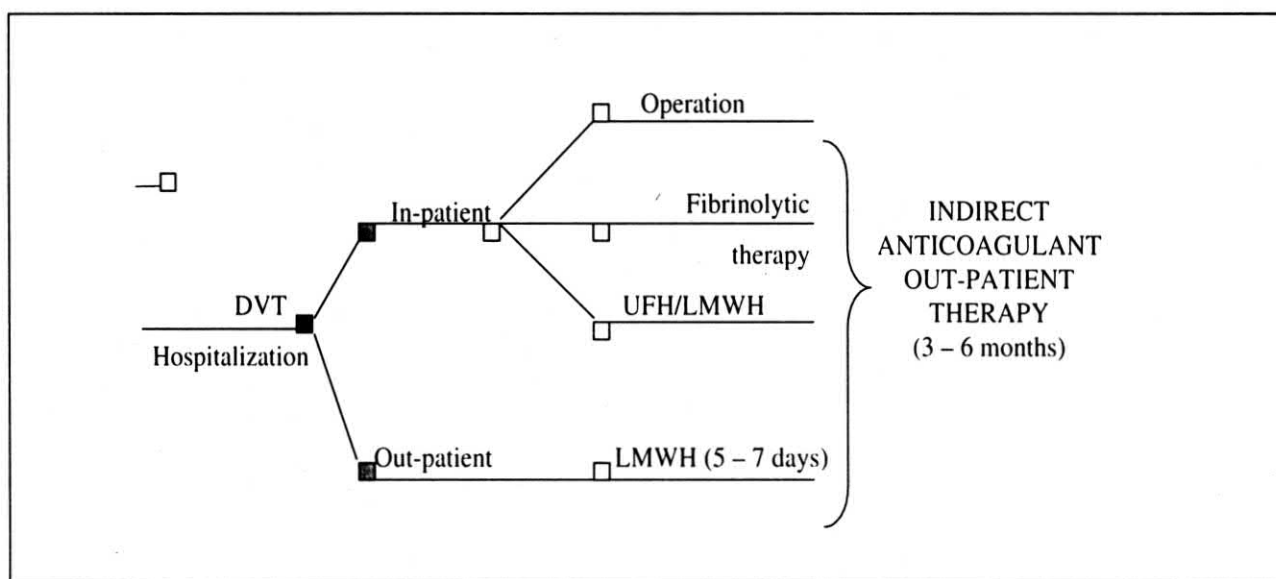
are also eligible for hospital treatment. In spite of all this, as various studies show, 37–80 % of DVT patients are eligible for outpatient treatment with LMWH (7, 8, 9).

All facts lead to the wrong perception that GPs can treat DVT without consultation and monitoring by a vascular surgeon. Such conduct may lead to incomplete and inadequate treatment, which results in the occurrence of venous insufficiency and development of post-phlebitis syndrome (PPS). These conditions frequently lead to sustained disability of the patients affected.

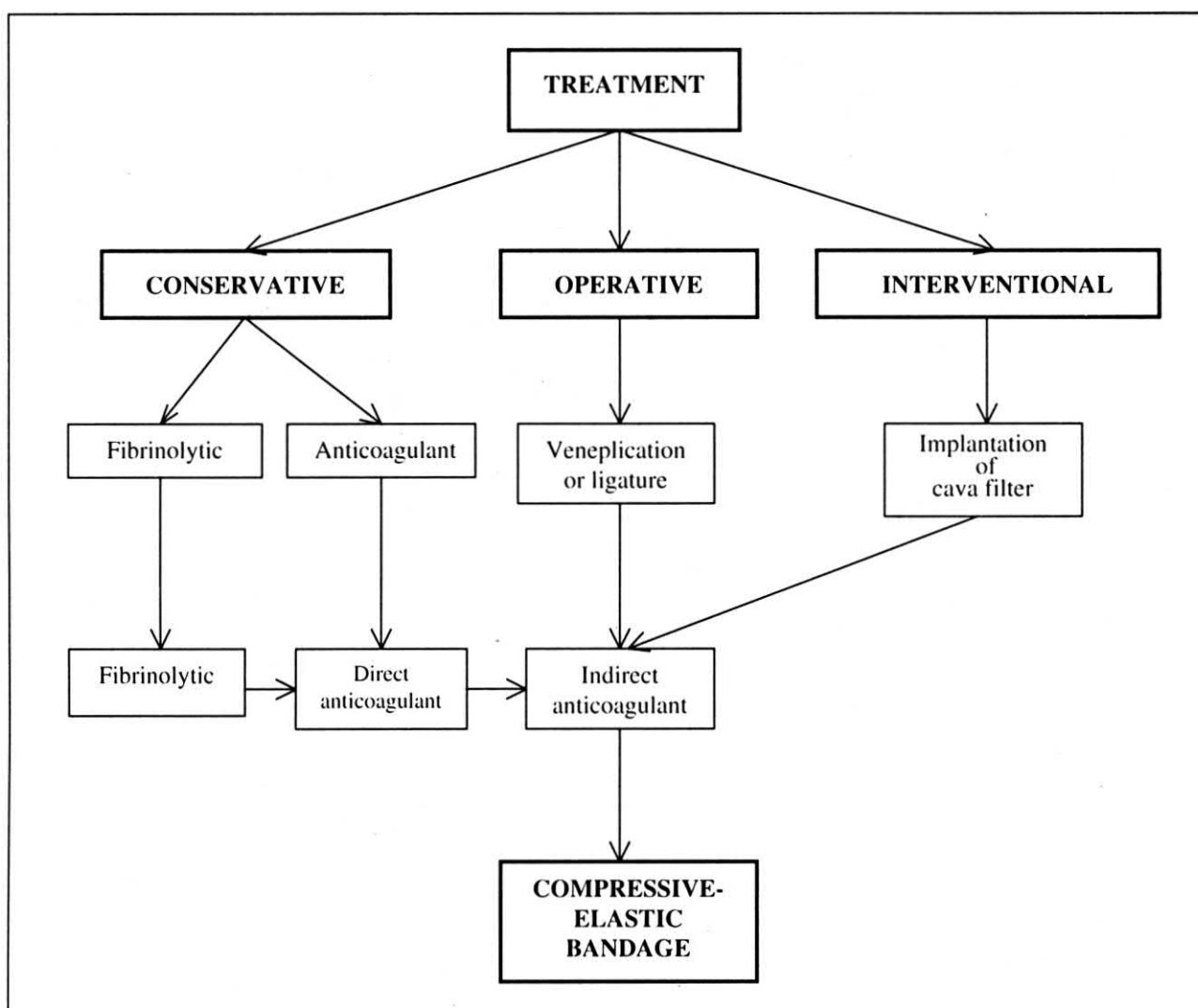
In order to achieve maximum therapeutic effect and minimise possible complications and increase in cost, it is necessary to achieve full coordination and synchronise of various levels of medical care: GPs, specialised and highly specialised physicians. Angiologists-vascular surgeons should play the leading role in this team since in Bulgaria angiology is not recognised as a separate speciality. Scheme 1 shows the coordination between GP and vascular surgeon in the treatment of DVT, as well as the control and dispensary monitoring. Currently, the conditions and requirements of the health insurance fund impede the quality fulfilment of these tasks, whereas the limitation of only one visit to a vascular surgeon per year is utterly insufficient.



Scheme 1: Basic model of coordination between GP and Angiologist in the treatment of DVT



Scheme 2: "Decision tree" approach in the treatment of DVT



Scheme 3: Algorithm for treatment of the patients with DVT

The proposed (Schemes 2, 3) example content of a clinical pathway and algorithm for treatment of DVT using the "decision tree" method can improve the approach to the therapy.

Conclusions

The presented data and results for the cost of treatment of DVT patients require considerable financing. From the economic point of view under the conditions of health insurance it is important to increase the number of patients treated in outpatient settings.

For this purpose it is necessary to have close collaboration and accurate assessment of indications and contraindications for home treatment in order to avoid wasting financial resource and compromise with the quality and safety of the therapy.

It is imperative to render greater access of the patients to vascular surgeons in an outpatient setting thus guaranteeing the quality and success of the treatment and sequelae of DVT.

As regards hospital care, the proposed example content of a clinical pathway can be grounds for the inclusion of DVT and venous insufficiency in the list of conditions covered by the health insurance fund.

References

- DOICYNOV, AL. *Clinical Angiology*. Sofia, 1992, 257–264.
- KREMENSKI, TZ. Thrombophlebitis of the low extremities. *Medinfo*, 2000, vol. 8, no. 6, p. 12–14.
- KREMENSKI, TZ., et al. On some therapeutical and pharmacoeconomical aspects of the treatment of deep venous thrombosis of the low extremities. *Angiology and Vascular surgery*, 2001, vol. 6, no. 2, p. 19–24.
- TOPALOV, I. – DOBREV, P. *Thrombophlebitis and pulmonary thromboembolism*. Sofia, 1981.
- TOPALOV, I. – ANASTASOV, V. – ZANZOV, I. *Post-thrombophlebitis disease*. Sofia, 1988.
- BLANCHEMAISON, P. Epidemiologie de l'insuffisance veineuse chronique des membres inferieurs; <http://www.phlebologie.com/fr/>
- FERRIS, R., et al. Treatment of deep venous thrombosis in outpatient settings: clinical, cost and quality of life issues. *J. National Home Infusion Association*, 1999, vol. 5, no. 8, p. 57–61.
- FRANK, D. – BLATTLER, W. Comparison of ambulatory and inpatient treatment of acute deep venous thrombosis of the leg: subjective and economic aspects. *Schweiz Med. Wochenschr.*, 1998, vol. 36, no. 128, p. 1328–1333.
- GRAU, E., et al. Home treatment of deep venous thrombosis: a two-years experience of a single institution. *Haematologica*, 1998, vol. 5, no. 83, p. 438–441.
- GROCE, JB. – BUIES, C. Patient outcomes and cost analysis associated with an outpatient deep venous thrombosis treatment program. *Pharmacotherapy*, 1998, vol. 63, no. 18, p. 175S–180S.
- HULL, RD. – PINEO, GF. – RASKOB, GE. The economic impact of treating deep vein thrombosis with low-molecular-weight heparin: outcome of therapy and health economy aspects. *Haemostasis*, 1998 vol. 28, Suppl. 3, p. 8–16.
- KREMENSKI, ZV. – GETOV, I. Pharmacoeconomic Assessment of Deep venous Thrombosis. *Farmaceutski glasnik*, 2001, vol. 57, no. 12, p. 459–464.
- RODGER, M., et al. Cost-effectiveness of low-molecular-weight heparin and unfractionated heparin in treatment of deep vein thrombosis. *CMAJ*, 1998, vol. 8, no. 159, p. 931–938.
- WIENERT, V. Epidemiology and socioeconomy of venous diseases in Germany. *Phlebologie*, 1992, vol. 4, p. 452.

Correspondence: Tzvetan Kremenski, MD
Military Medical Academy
Clinic of Vascular Surgery and Angiology
3, Georgi Sofiiski Street
Sofia-1606
e-mail: tzkremenski@yahoo.com

Received 10. 6. 2003