SURVEY OF THE MANAGEMENT OF DEEP VEIN THROMBOSIS IN GENERAL PRACTICE IN THE CZECH REPUBLIC

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Background: To investigate the management of (suspected) deep vein thrombosis in general practice.
Methods: Self completing postal questionnaire among a random sample of 692 general practitioners in the Czech Republic.
Results: The overall response rate was 58%. Eighty-nine percent of the respondents initiated objective evaluation. Fever than 3% usually make the diagnosis on clinical grounds only. Ninety-two percent of the respondents initiated adequate treatment in the last patient seen with deep vein thrombosis. No more than 4% usually treat patients with a vitamin K antagonist alone. The respondents frequently referred a patient to a specialists, 41% in order the diagnosis and 85% for treatment. As many as 44% of them feel that management of deep vein thrombosis is a mandate of the general practitioner. For those who do not, the availability of diagnostic and therapeutic facilities are the main obstacles.
Conclusion: In general practice objective diagnostic methods to evaluate suspected deep vein thrombosis are routinely used and patients receive adequate treatment. Although patients are frequently referred to the hospital many general practitioners feel that they would be competent anough to manage these patients on an outpatient basis.
Keywords: deep vein thrombosis, venous thromboembolism, general practice, anticoagulant, questionnaire survey.

LÉČBA HLUBOKÉ ŽILNÍ TROMBOSY V ORDINACÍCH PRAKTICKÝCH LÉKAŘŮ V ČESKÉ REPUBLICE
Cíl: Sledovat léčbu (suspektní) hluboké žilní trombózy v ordinacích praktických lékařů.
Metodika: Standardizovaný dotazník byl rozeslán 692 praktickým lékařům pro dospělé v České republice.
Výsledky: Návratnost dotazníku činila 58%. Objektivní vyšetření provádí 89% respondentů. Méně než 3% praktických lékařů obvykle stanovuje diagnózu pouze na základě hodnocení klinických projevů. 92% praktických lékařů zahajuje adekvátní léčbu pacientů s hlubokou žilní trombózou. 4% praktických lékařů běžně léčí pacienty pouze léky ze skupiny antagonistů vitaminu K. Z průzkumu vyplynulo, že praktičtí lékaři často odesílají pacienty k odborným lékařům angiologům/ flebologům, 41% praktických lékařů k potvrzení diagnózy a 85% lékařů rovněž k léčbě pacientů. 44% praktických lékařů si myslí, že léčba hluboké žilní trombózy je mandátem praktických lékařů. Pro ty, kteří nesouhlasili, je nedostatek diagnostických a terapeutických možností hlavní překážkou.
Závěr: V ordinacích praktických lékařů jsou běžně používány objektivní diagnostické metody potvrzující hlubokou žilní trombózu a pacienti dostávají adekvátní léčbu. Třebaže jsou pacienti často odesíláni k hospitalizaci v nemocnici, mnoho praktických lékařů si myslí, že by byli dostatečně kompetentní pečovat o pacienty s hlubokou žilní trombózou v ambulantní péči.
Klíčová slova: hluboká žilní trombóza, žilní tromboembolizm, praktičtí lékaři, antikoagulancia, dotazníkový průzkum.

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Introduction

Deep leg vein thrombosis in general practice is relatively rare with an annual incidence of one to two per 1000 inhabitants (1–3). Nevertheless, it is considered an important and serious condition because of the associated morbidity and mortality (4–6). Several studies have shown that approximately 10% of the patients with confirmed leg vein thrombosis also have symptomatic pulmonary embolism. In addition, silent pulmonary embolism can be detected in at least 50% of patients (4, 7, 8). Another, potential complication causing significant disability is the post-thrombotic syndrome which will develop in about two thirds of the patients (9–16).

In the past three decades, the diagnostic and therapeutic management of patients with (suspected) deep vein thrombosis has changed substantially. Numerous studies have demonstrated that by using objective diagnostic methods the diagnosis can be ruled out in approximately 70% of patients presenting with clinically suspected deep vein thrombosis (1, 2, 17, 18). Hence, in order to prevent unnecessary and potentially harmful anticoagulant treatment, objective confirmation in each patient is mandatory. Although venography is considered the reference method, other, non-invasive tests such as serial impedance plethysmography and compression ultrasonography have shown to be reliable alternatives (19–21).

Also, the therapeutic management of patients with deep vein thrombosis has been improved. The need for initial treatment with dose adjusted heparin to reduce the risk of a recurrent thromboembolic event is unequivocally established (22, 23). However, for this treatment, which is routinely given intravenously, patients need to be hospitalized. The introduction of low molecular weight heparins, which can be administered subcutaneously once or twice daily without the need for laboratory control, has made out-of-hospital treatment feasible (24–27).

These changes allow general practitioners to be more involved in the care of patients with (suspected) deep vein thrombosis. However, little is known about the actual management in general practice. Therefore, a survey was performed to investigate the current diagnostic and therapeutic management strategies of general practitioners in the Czech Republic and we also assessed their attitude towards possible outpatient or home treatment.

Methods

The addresses of a random sample (15%) of all registered and currently active general practitioners in the Czech Republic in 2004 were obtained from the Institute of Health Information and Statistics of the Czech Republic (IHIS, Czech Republic). The general practitioners received a postal questionnaire which was designed in three sections. In the first one, they were asked to describe their diagnostic approach in the last patient seen with suspected deep leg vein

thrombosis. In the second part information was requested about the therapeutic approach in the last patient in whom a deep vein thrombosis was diagnosed. The final section contained questions concerning the competence and willingness to treat patients with thrombosis on an outpatient or home care basis.

A reminder, including a new questionnaire, was sent to all non-respondents after 4 weeks. Another 4–6 weeks later the remaining non-respondents were approached by telephone. The three sections of the questionnaire were analysed separately. The section about the diagnostic and/or therapeutic approach was excluded for analysis if:

- the general practitioner was not able to identify a patient in whom a deep vein thrombosis was suspected or diagnosed
- there was concurrent (suspicion of) pulmonary embolism
- the described episode occurred before January 2002.

The statistical package SPSS 10.0 software for Windows was used for statistical data analysis (SPSS Inc., Chicago, III). The influences of patient, general practitioner and practice related variables on the diagnostic approach were analyzed using discriminant analysis.

Results

Response rate

Out of the total of 5252 general practitioners registered in the Czech Republic in 2004, 790 were randomly selected. Of these, ninety-eight appeared to be no longer active as general practitioners. A complete questionnaire was obtained from 399 of the 692 eligible general practitioners (response rate of 58%). Of the 293 non-participating general practitioners, 47 (7%) indicated that they were unable to recall eligible patients. The respondents formed a representative sample of general practitioners in the Czech Republic (Table 1).

Table 1. Comparison between the respondents and the general practitioners in the Czech Republic

	Population		Respondents	
	n = 5252	%	n = 399	%
SEX DISTRIBUTION				
Male	2468	47	176	44
Female	2784	53	223	56
AGE (YEARS)				
< 40	1103	21	101	25
40-49	2784	53	199	50
≥ 50	1365	26	99	25
GEOGRAPHIC DISTRIBUTION (REGION)				
Prague	1145	21,8	83	20,8
Stredocesky	436	8,3	34	8,5
Jihocesky	278	5,3	23	5,8
Plzensky	304	5,8	25	6,3
Karlovarsky	136	2,6	10	2,5
Ustecky	326	6,2	25	6,3
Liberecky	179	3,4	13	3,2
Kralovehradecky	284	5,4	22	5,5
Pardubicky	205	3,9	16	4
Vysocina	200	3,8	14	3,5
Jihomoravsky	625	11,9	47	11,8
Olomoucky	341	6,5	26	6,5
Zlinsky	231	4,4	17	4,3
Moravskoslezsky	562	10,7	44	11
URBANIZATION				
Urban	2206	42	151	38
Mixed	1050	20	81	20
Rural	1996	38	167	42
PRACTICE ORGANIZATION				
One general practitoner	2574	49	186	47
Two (partnership)	1628	31	129	32
More than two (centres)	1050	20	84	21

Table 2. Diagnostic approach by general practitioners in the Czech Republic in their last patient seen with suspected deep vein thrombosis

	n = 355	%
Direct referral to a specialists	145	41
Further objective diagnostic tests initiated	170	48
Ultrasonography	147	41
Ultrasonography + impedance plethysmography	7	2
Ultrasonography + venography	4	1
Impedance plethysmography	12	3
Clinical assessment only	40	11

Diagnostic approach

For analysis of the diagnostic approach, 44 questionnaires were excluded because the general practitioner could not identify a patient (26), the patient had a concurrent suspicion of pulmonary embolism (3), or the patient was seen before January 2002 (15).The mean age of 355 documented patients was 58 years (range: 18 to 86) and 57% were female. Almost a quarter of the patients had a history of previous deep vein thrombosis. The mean pre-test probability of thrombosis was estimated to be 64%.

A total of 40 general practitioners (11%) based their diagnostic decision on (repeated) clinical assessment only (Table 2). The other 315 general practitioners initiated objective evaluation of suspected deep vein thrombosis which was about equally divided between direct referral to a specialist and further diagnostic testing which they initiated themselves. Ultrasonography was used in a great majority of patients.

For 77% of the general practitioners the described diagnostic strategy was their usual approach, while only 10 of the 40 general practitioners (25%) who restricted themselves to clinical assessment indicated that this was their standard procedure. The reasons to refrain from objective diagnostic testing in the remaining 30 patients were an atypical presentation (hardly any signs and symptoms or pointing to an other condition, N=16) and patient – related factors (such as terminal stage of malignancy, N=10). Four patients consulted the specialist for the same condition earlier in the episode.

If objective evaluation was initiated, four factors showed in discriminant analysis a significant influence on the decision whether or not to refer the patient to a specialist. General practitioners more often initiated objective testing themselves if the pre-test probability was lower, the patient was older, the practice had more than two general practitioners and was situated in an urbanized area (Table 3).

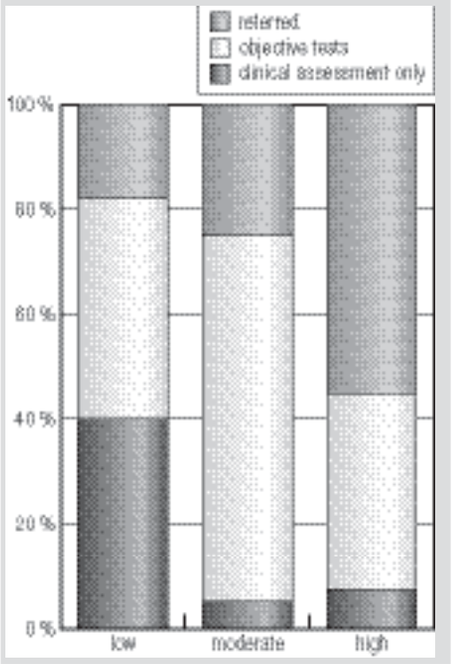
The influence of the pre-test probability on the diagnostic approach is illustrated in Fig. 1. Only 60%

Table 3. Variables which showed signicance in discriminating whether or not to refer a patient in objective evaluation*

Variable	Standardized canonical discriminant function coefficient
Pre-test probability	0,87
Age of the patient	-0,45
Practice organization	0,29
Urbanization	-0,29

*In a standardized canonical discriminant function which correctly classified 70% of the cases

Figure 1. Relation between pre- test probability in suspected deep vein thrombosis and diagnostic approach



of the general practitioners initiated objective evaluation if the estimated pre-test probability was low. In case it was moderate or high, 95% of the general practitioners initiated objective evaluation, predominantly by themselves in the moderate pre-test probability group, and more through referral if the pre-test probability was estimated as high.

When the testing was initiated by the general practitioner, it was done on the same or next day in 90% of the patients. Of those patients who were referred, 98% were seen by a specialist within 24 hours.

Eventually, 62% of all patients suspected for deep vein thrombosis were diagnosed as having deep leg vein thrombosis. The diagnosis was confirmed in 50% of the patients in whom the general practitioners initiated the testing, and 78% of those referred to a specialist.

Therapeutic approach

For analysis of the therapeutic approach, 80 questionnaires were excluded because the general practitioner could not identify a patient (42), the patient had concurrent pulmonary embolism (7) or the patient was seen before January 2002 (31).

In one-third of the questionnaires the described patient was an eligible patient from earlier on than the one used for the diagnostic section, mainly because the diagnosis in that patient was ruled out. The mean age of the 319 included patients was 57 years (range: 18 to 84) and 53% were female.

A total of 85% of the general practitioners referred the patient to a specialist for treatment, 13% started treatment themselves and in six cases no treatment was given (Table 4). Of these patients treated by their general practitioner half received unfractioned (or low molecular weight) heparin with or without a vitamin K antagonist. The treatment with low molecular weight heparin is currently practiced, albeit on a limited scale. In 17 patients the treatment was a vitamin K antagonist alone.

About a fifth of the general practitioners deviated from their usual therapeutic approach in the described patient. The most important reasons were patient related factors such as the physical condition of the patient or treatment refusal, and the clinical presentation. However, 12 of the 17 general practitioners who prescribed only a vitamin K antagonist indicated that this was their usual management.

Attitude towards treatment of deep vein thrombosis in general practice

Twenty-seven percent of the 145 general practitioners, who referred their patient to a specialist for further diagnostic evaluation, indicated that this was not their diagnostic approach of first choice. The most important limitation mentioned was the availability and accessibility of diagnostic facilities.

For twenty-five percent of the 271 general practitioners who referred the patient to a specialist for treatment this was not their therapeutic management of first choice. Important considerations were the experienced limited accessibility of diagnostic facilities for general practitioners and therapeutic (im) possibilities.

Of the 399 general practitioners, 226 (57%) consider themselves competent to treat patients with deep vein thrombosis on an outpatient or home care basis. According to 175 of the respondents (44%), treatment of deep vein thrombosis could be considered a mandate of the general practitioner (Table 5). Of those who disagreed, almost one-third mentioned insufficient facilities for treatment on an outpatient or home care basis as a reason, while a quarter indicated the lack of diagnostic facilities as a major obstacle.

Table 4. Therapeutic approach by the general practitioners in the Czech Republic in their last patient seen with deep vein thrombosis

	n = 319	%
Direct referral to a specialists	271	85
Treated by the general practitioner	42	13
Low molecular weight heparin ± a vitamin K antagonist	21	6
Unfractioned heparin ± a vitamin K antagonist	2	1
A vitamin K antagonist	17	5
Other medication	2	1
No treatment	6	2

Table 5. Should the treatment of deep vein thrombosis be considered as a mandate of the general practitioner

	n = 399	%	n*	%
Yes	175	44		
Without any comment			41	23
The outpatient (home treatment) very well possible (with LMWH)**			53	30
If quick, adequate diagnostic facilities available			40	23
If uncomplicated; depending on patient´s condition			26	15
If agreed on protocol; in liaison with specialist			23	13
No	202	51		
Without any comment			47	23
Insufficient therapeutic facilities			64	32
Insufficient diagnostic facilities			47	23
Risk of complications (pulmonary embolism)			33	16
Insufficient knowledge, experience, low incidence			19	9
In doubt	21	5		
Without any comment			2	10
Depending on patient´s condition, situation			8	38
Missing	1	0		

*LMWH = low molecular weight heparin, **More than one comment possible

Discussion

The advances in the diagnosis and treatment of deep leg vein thrombosis offer the general practitioner new opportunities to manage patients with suspected deep vein thrombosis on an outpatient or home care basis. However, knowledge on the actual management of these patients in general practice is not available.

This survey, in a representative sample of Czech general practitioners, shows that approximately 90% of them use objective diagnostic methods to verify or refute the diagnosis of deep leg vein thrombosis. This was accomplished either through referral to a specialist or by requesting diagnostic investigations themselves. In addition, most general practitioners who did not use objective diagnostic techniques in their last patient indicated that this is not their usual practice, but it was dictated by specific clinical conditions. Fewer than 3% of the respondents usually make the diagnosis on clinical grounds only. Thus, compared with a similar survey preformed 16 years ago in the Netherlands, there is a marked shift from clinical assessment only (then 31%, now 11%) towards the use of objective diagnostic methods (28). In case of objective evaluation, a low or moderate pre-test probability frequently leads to further objective diagnostic tests coordinated by the general practitioner himself / herself, while a high pre-test probability is more often followed by referral to a specialist. However, more general practitioners would like to control diagnostic testing if they could more readily access the diagnostic facilities.

Almost all of the general practitioners (92%) initiate adequate treatment for deep vein thrombosis either through referral or by using (low molecular weight) heparin or a vitamin K antagonist. In this survey, fewer than 4% of the Czech general practitioners prescribe only a vitamin K antagonist in their usual therapeutic approach. Therefore, the recommended initial treatment for deep leg vein thrombosis with heparin and a vitamin K antagonist is widely applied (24–27). Outpatient or home treatment with low molecular weight heparin is currently practiced, albeit on a limited scale. Interestingly, almost 60% of the general practitioners feel that they can treat patients with deep leg vein thrombosis on an outpatient or home care basis.

Several methodological aspects deserve attention. Our survey has the well known restrictions of postal questionnaires including a limited response rate (29–33). The response rate (65%) appeared reasonable and there was no significant difference between responders and non-responders with respect to age, gender and practice location/organization. Besides that, it is almost impossible to carry out a prospective study on the actual behaviour of general practitioners since the incidence of (suspected) deep vein thrombosis is so low. To examine actual instead of the intended behaviour the general practitioners were asked to describe their diagnostic and therapeutic approach in their last patient seen. If a described episode occurred before January 2002, it was excluded for analysis to reduce recall errors and to obtain up-to-date information. To further increase the reliability and to avoid socially desired answers, respondents were invited to comment on whether and why they deviated from their usual approach. Nevertheless, our method did introduce some recall bias which for instance may explain the observation that almost two-thirds of all suspected patients were diagnosed as having deep vein thrombosis, while it should have been 30–50% (1–3).

Despite a limited response rate and inevitable methodological shortcomings this survey reveals a representative picture of the diagnostic and therapeutic approach to deep leg vein thrombosis in general practice in the Czech Republic. Objective diagnostic methods are routinely used and patients with deep vein thrombosis receive adequate treatment. For this, many patients are being referred to a specialist (41% to confirm the diagnosis and 85% for treatment) but a lot of the general practitioners feel that they should be able to treat deep vein thrombosis on an outpatient or home care basis.

Outpatient or home treatment with low molecular weight heparin in combination with oral anticoagulant therapy is an effective and safe option for treating deep vein thrombosis. The current developments have made out-of-hospital treatment feasible (23–25). Efficiency and economic considerations will increase the use of primary care resources. However, according to its incidence, deep vein thrombosis is a disease which some general practitioners prefer to diagnose and treat on their own, while others will continue to refer. Improving access to adequate diagnostic facilities combined with the development of guidelines for outpatient or home treatment will enable more general practitioners to take part in the management of deep vein thrombosis.

For successful management, however, a shared-care type of model with local arrangements for diagnosis, treatment and long-term follow-up among all of those involved will be necessary. First, the general practitioner has to determine which patient should be referred and for which test. In this respect, protocols helping to standardize the complaints of the patients and the physical diagnostic signs are very useful. Diagnostic tests could be added to these protocols (34) to prove or rule out the diagnosis. The use of certain terms and the lack of a clear statement can in particular cause confusion and lead to a poor communication between the general practitioner and the specialists. There is some evidence that this approach can lead to a well balanced use of diagnostic tests (35).

Although it seems likely that an increase in diagnostic possibilities for the general practitioners could lead to a decrease in referral to a specialist, a decrease in in-hospital stay could lead to a poor communication between the general practitioners and the specialist, there is remarkably little research done in this field (35). In the United Kingdom, the effect of a better access to diagnostic facilities was studied in their practice in Southampton. They found a considerable decrease in a number of hospital referrals which seemed to be related to an increased number of diagnostic consults. Since no normal cost-effectiveness analysis was done, the precise effects are not known. Later studies, mainly from the United Kingdom and the US, seem to confirm this picture (36, 37).

Due to the use of standards in the GP practice and the advent of information technology, studies addressing the real impact of a shared-care type of model for diagnosis, treatment and long-term follow-up will become easier to perform and will provide all of those involved with more evidence of a positive effect on the clinical outcome.

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