Clinical Characteristics of Thai Chronic Venous Insufficiency (CVI) Patients

Burapa Kanchanabat MD*, Chanean Ruangsetakit MD**, Waigoon Stapanavatr MD*

** Faculty of Medicine Vajira Hospital, Navamindradhiraj University, Thailand*
*** Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand*

Objective: *To study the demographic and clinical presentations as assessed by Clinical Severity Score (VCSS) and Venous Disability Score (VDS) in Thai Chronic Venous Insufficiency (CVI) patients.*
Material and Method: *Retrospective review of prospectively collected data.*
Results: *There were 78 CVI patients (102 legs) with the mean age of 59.6 years and 42% spending more than 75% of working hours upright. The proportional of C4, 5 and 6 were 24.4%, 9.0% and 66.7%. The mean BMI was 26.9. Seven legs (6.9%) had prior history of DVT. In 90 legs with no previous operation, the mean VCSS and VDS were 9.8 and 0.9 respectively. The mean VCSS for C4, C5 and C5 were 7.1,7.0 and 12.1. Pain was perceived in 50% and associated with venous eczema. The combined superficial and deep vein reflux were found in 57.8%. Overall, the prevalence of superficial and deep vein reflux was 80.0% and 63.3%. The venous pulsatile arterial wave was found in 3.3%. The visible varicose veins were found in only 50.0% and tended to be mild.*
Conclusion: *The symptoms are mild. Despite low prior DVT rate, the prevalence of deep vein reflux is high and commonly combined with superficial vein reflux. Reflux commonly located below the knee, adjacent to the ulcers. Visible varicose are infrequent but most of those veins are associated with reflux.*

Keywords: *chronic venous insufficiency, venous clinical severity score (VCSS), venous disability score (VDS), clinical manifestation, venous reflux*

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Although the exact prevalence of Chronic Venous Insufficiency (CVI) in Asia is not known, reports on the Asian population in western countries and our previous, limited report[1-5] suggested that CVI is not uncommon and the characteristics may differ from those found in the west. Although the clinical part (C4-6) of CEAP classification (Table 1) is most widely used for classification of CVI patients. It's ability to delineate the clinical severity is limited and venous severity scoring is suggested as an adjunct to the CEAP system. The aim of the present research was to study the demographic and clinical presentations as assessed by the venous severity score[6], which was consisted of Venous Clinical Severity Score (VCSS) and Venous Disability Score (VDS) in Thai chronic venous insufficiency (CVI) patients.

Correspondence to:
Kanchanabat B, Department of Surgery, Faculty of Medicine, Vajira Hospital, Navamindradhiraj University. 681 Samsain road, Dusit, Bangkok 10330, Thailand.
Phone: +66-2-2443281, Fax: +66-2-2443282
E-mail: burapa04@icloud.com

Material and Method

The data of CVI patients (CEAP, clinical severity 4-6) who attended the Vajira Hospital Vascular Clinic from October 1st 2006 to September 30th 2013 were prospectively collected and retrospectively reviewed. All patients were subjected to history taking and physical examination by standard protocol. In

patients with bilateral CVI, clinical severity was classified according to the higher scoring leg. There were specific questions regarding: "entire leg swelling that required medical attention"; "blood clot in the leg vein"; "long term blood thinning medications or warfarin/caumadin medications for problems with one's vein"; "proportion during working hours in the upright posture". Foreign nationality and Caucasian ethnic patients were excluded. The ultrasound examination was performed with the patients upright and supporting their weight on the contralateral leg. The venous reflux was elicited by distal manual compression and rapid release. The reflux time of more than 500 milliseconds was defined as venous reflux. The Ethical Committee of the Bangkok Metropolitan Administration approved the presnt study.

Results

There were 102 chronic venous insufficiency legs (C4-6) in 78 patients who had completed the protocol. The patient demographics was presented in Table 2. The history of deep vein thrombosis were presented in 6.9%. The most common occupation was indoor laborer, and cooking-related jobs in particular which account for 40% of the females (Table 3). Forty-two percent of the patients spend more than 75% of their working time walking and standing. Patients with ulcers (C6) spend significantly more of their working hours upright than C4 patients ($p = 0.047$). In 90 CVI legs without previous surgical intervention, the mean value of VCSS was 9.8±3.8 (2-19) (Table 4), the mean value of VDS was 0.9±0.6 (0-3) (Table 5). The respective mean value of VCSS of C4, C5 and C6 were 7.1±2.7 (2-11),7.0±1.0 (5-8) and 12.1± 3.2 (6-19). The VCSS of pain, varicose vein, edema, skin pigmentation, inflammation and induration were dichotomized in to the following groups: absent or mild; and moderate or severe. Compared between C4 and C6 legs. Only the induration was statistically different between these groups ($p = 0.01$). Pain were significantly more common in patients with inflammation ($p<0.002$). Half (50%) of the CVI legs were painless. Physical findings of varicose vein was found in 50% of legs without previous superficial vein surgery, 58% of those were grade 1. Extensive varicosity involving the calf and thigh (grade III) was presented in 5.6%. However, additional duplex ultrasonography revealed great saphenous reflux in 68.8% of the legs without visible varicose veins (VCSS 0). In the legs with superficial vein reflux (SVR), obvious varicosity (VCSS 2 and 3) was found in only 21 legs (29.2%). Most patients (68 of 90, 75.6%) never used compressive therapy. From the total of 64 legs with ulceration (including 6 recurrent legs), there were 80 ulcers. The most common location of the ulcers, which was in 66.3% (53 ulcers), was medial side of distal leg. Fifteen ulcers (18.8%) located on the lateral side. Other locations of ulcers included the anterior leg (7.5%, 6 ulcers) and dorsum of the foot or heel (7.5%,6 ulcers).

In 90 legs without previous operation, the most common ultrasonographic finding was combined superficial and deep vein reflux (DVR) (57.8%), while the prevalence of isolated DVR, and isolated SVR were 5.6% and 22.2% respectively. The overall prevalence of DVR and SVR was 63.3% and 80.0% respectively. In addition, obstruction of the deep vein was found in 2.2% (n = 2), pulsatile superficial vein in 3.3% (n = 3), with no abnormal ultrasonographic findings in 8.9% (n = 8). The ultrasonographic findings are represented in Table 6.

Discussion

The CVI seems to affect populations with lower socioeconomic status, probably related to occupations that require long hours laboring in the upright position. The association of venous ulcer and lower socioeconomic status was also noted in matched case-control study in England[7]. Upright position may associated with ulceration as the patients with venous ulcers (C6) was found to significantly spent more time in upright position when compared with patients with skin change (C4). Small proportion of patients was obese (17.9%).

Patients with venous ulcers constituted the major bulk (66.7%) of our population. However, the subjective symptoms were relatively mild. The average venous clinical severity score of Thai CVI were remarkably lower than the report by Welch et al which reported the mean VCSS of 20.0 for C6 patients compared with 12.1 in the present study[8]. Only the minority of patients experienced significant pain (severe pain 10%), even the patients with venous ulcer and those who had associated more with inflammation or venous eczema. This was in stark contrast to the western reports[9,10] which was summarized by

Table 1. CEAP clinical classification of CVI paients (C4-6)

Clinical class	Description
C4	Skin changes, pigmentation, venous eczema or lipodermatosclerosis
C5	Skin changes with healed ulceration
C6	Skin changes with active ulceration

Table 2. Demographic of 102 CVI legs of 78 patients

Age	59.6±12.5 (27-84) year
Sex (male:female)	35(44.8%):43(55.1%)
Body mass index	26.9±5.4(16.8-40.3)
Previous DVT (n = 102 legs)	7 (6.9%)
History of ipsilateral leg trauma or major non-venous leg surgery (n = 102 legs)	12 (11.8%)
Family history of varicose vein (n = 78)	14 (17.9%)
Number of C4, 5, 6 patients (n = 78)	19 (24.4%):7 (9.0%): 52 (66.7%)
Duration of ulcer (n = 64)*	5 mo. (med) (2 wk. - 12 yr.), 17 legs (27%) had ulcer for more than 1 yr.
Duration of skin change (n = 64)*	14 mo. (med), (2 wk. - 12 yr.)
Ulcer size (largest diameter) (n = 64)*	3 cm (med), (0.4-11cm.)
Ulcer number (n = 64)*	1.2 mean, (1-3)

*64 ulceration event of 58 legs (including 6 recurrences)

Table 3. Occupation of 76 CVI patients

	female n (%)	male n (%)
Clerk/office worker/retired	7 (16.6)	7 (20.6)
Indoor labour/cook	32 (76.2)	15 (44.1)
Outdoor labour/farmer/constructor	3 (7.1)	12 (35.3)

(occupational data was unavailable in 2 patients)

a recent systemic review[11] as "Pain was a dominant theme and was consistent across all studies. It was significant, described as the worst symptom and the cause of enormous suffering". Except for induration, there seems to be no difference in others symptoms such as pain, swelling, inflammation and varicosity when comparing between patients with venous ulcer (C6) and skin change (C4). Marked varicosity is infrequent as the visible varicose veins were found in only half of CVI legs. When present, they tended to be mild (VCSS class 1 in 58% of varicose legs). However, most (68.8%) of the legs without visible varicose veins had SVR as demonstrated by ultrasonography. This pattern was also reported by Welch, et al[8] who found visible varicose veins in only 46% of patients with venous ulcers.

Small numbers of legs had past history of DVT (6.9%) compared with the 29% - 93% rate in Western

Table 4. Venous clinical severity score 90 CVI legs without previous operation

Symptom/grade	Absent (%)	Mild (%)	Moderate (%)	Severe (%)
Pain	45 (50.0) (None)	16 (17.8) (Occasional, not restricting activity or requiring analgesic agents)	20 (22.2) (Daily moderate activity limitation; occasional analgesic agents)	9 (10.0) (Daily, severe limiting activities or requiring regular use of analgesic agents)
Varicose vein (4 mm diameter)	45 (50.0) (None)	26 (28.9) (Few, scattered; branch veins)	14 (15.6) (Multiple; greater saphenous veins, confined to calf or thigh)	5 (5.6) (Extensive; thigh and calf, or greater and lesser saphenous distribution)
Venous Edema	41 (45.6) (None)	20 (22.2) (Evening ankle edema only)	12 (13.3) (Afternoon edema, above ankle)	17 (18.9) (Morning edema above ankle and requiring activity change, elevation)
Skin pigmentation	2 (2.2) (None or focal low intensity (tan))	26 (28.9) (Diffuse, but limited in area and old (brown))	39 (43.3) (Diffuse over most of gaiter distribution (lower 1/3) or recent pigmentation (purple))	23 (25.6) (Wider distribution (above lower 1/3) plus recent pigmentation)
Inflammation	77 (85.6) (None)	8 (8.9) (Mild cellulitis, limited to marginal area around ulcer)	4 (4.4) (Moderate cellulitis, involves most of gaiter area (lower 1/3))	1 (1.1) (Severe cellulitis (lower 1/3 and above) or significant venous eczema)
Induration	11 (12.1) (None)	13 (14.4) (Focal, circummalleolar (5 cm))	38 (42.2) (Medial or lateral, less than lower third of leg)	28 (31.1) (Entire lower third of leg or more)
No. of active ulcer	42 (46.7) (no ulcaration)	38 (42.2) (1 ulcer)	7 (7.8) (2 ulcers)	3 (3.3) (>2)
Active ulcer duration	43 (47.8) (None)	22 (24.4) (<3 months)	16 (17.8) (>3 months, <1 year)	9 (10.0) (Not healed 1 year)
Active ulcer size	44 (48.9) (None)	13 (14.4) (<2 cm)	18 (20.0) (2-6 cm.)	15 (16.7) (>6)
Compressive therapy	68 (75.6) (Not used or patients not complianct)	11 (12.1) (Intermittent use of stockings)	8 (8.9) (Wears elastic stockings most days)	3 (3.3) (Full compliance; stockings elevation)

Table 5. Venous disability score of CVI legs without previous operation (information not available in 3 legs)

Score/description	n (%)
0 = asymptomatic	17 (19.5)
1 = symptomatic but able to carry out usual activities with- out compressive therapy	60 (70.0)
2 = can carry out usual activities only with compression and/or limb elevation	9 (10.3)
3 = unable to carry out usual activities even with compression and/or limb elevation	1 (11.5)

Table 6. Ultrasonographic findings in 90 CVI legs without previous operation

Location of reflux	n (%)
No abnormality identified	8 (8.9%)
Isolated superficial vein reflux	20 (22.2%)
Isolated deep vein reflux	5 (5.6%)
Combined superficial and deep vein reflux	52 (57.8%)
Overall superficial vein reflux	72 (80.0%)
Overall deep vein reflux	57 (63.3%)
Pulsatile wave in superficial vein	3 (3 patients) (3.3%) (accompany with pulsatile deep vein in 1 legs)
Deep vein obstruction with superficial reflux	2 (2.2%)

reports[12-16]. Paradoxically, the overall prevalence of DVR was high (63.3%). This was consistent with a report from Hong Kong (73.3%)[17] and Japan (51%)[18]. An Asian multiethnic study in San Diego[1] also found a higher odd ratios of DVR and tropic change despite a lower rate of prior DVT when compared with white ethnic. The nature and cause of DVR in Thai patients is unclear, probably secondary from volume over-load of SVR.

Rather than the post thrombotic nature of CVI from high DVT prevalence in the west, we postulated that the superficial venous reflux and venous hypertension may be the primary abnormality and the deep vein reflux occurred secondarily to the overflow of superficial venous reflux. This was supported by the finding that our venous ulcer patients responded favorably to superficial vein surgery[19]. Of the 39 vein stripping operations for active venous ulcers (C6), 90% wound healing was achieved with a median healing time of 21 days. The 30-day healing rate was 64% and the 14-day healing rate was 38%. At the median follow-up time of 22 months, the 2-year and 6-year recurrence rate in our patients were 3 percent and 22 percent, respectively[19]. The deep vein reflux which was presented in majority of patients may not associated with poorer outcome.

Although gaiter area (antero-superior to medial malleolus), is the typical location, the present study showed more than one-third of patients, the venous ulcer could located elsewhere such as lateral ankle, dorsum of foot or even posterior to the heel. An unusual ulcer location may pose diagnostic difficulties as the skin lesions (liposclerosis and hyperpigmentation) are nonspecific. Exclusion of other possible causes, the presence of venous reflux and the respond to compression therapy or surgical reflux eradication could establish the diagnosis in these circumstances. The paucity of patients who utilized stocking highlight the lack of recognition and awareness of healthcare personal to this disease in Thailand.

The absence of venous reflux in some patients, the presence of pulsatile venous signal and the presence of superficial venous reflux despite no observable varicosity highlight the fact that the etiology of CVI is not completely understood. It may be the end point

of multiple etiologies at various venous locations with a complex relationship between mechanical force and cellular inflammatory responses[20-22]. While post thrombotic vein valve destruction may be the predominant etiology of CVI in Western countries, the lower prevalence of DVT in Thailand and other parts of Asia may give prominence to other unidentified causes. The CVI patients may harbor a predisposing risk such as an inherent weakness of vein wall or valve aggravated by subsequent events among which occupation, posture and infection has been postulated[23].

Conclusion:. The subjective symptoms are mild and the pain is infrequent and associated more with the inflammation than ulceration. Only a small number of patients had prior history of DVT and could be accounted as post thrombotic. Paradoxically, the prevalence of DVR was high, and most commonly combined with SVR. The visible varices are infrequent but most of those inconspicuous superficial veins were found to harbor reflux. Our findings highlight the fact that CVI is the end point of diverse and overlapping etiology, has not been completely identified, and may vary among ethnic groups.

What is already know on this topic?

As far as we know, no previous report of clinical characteristic of Thai CVI patients (except our previous preliminary report) has been reported.

What is this study adds?

1. Symptoms are milder compare with western reports. Sever pain is infrequent, even in the patients with advance stage of venous ulcer.

2. Small proportion of CVI patients with past history of deep venous thrombosis. This suggested different etiology from those found in the west which generally believed to be post thrombotic.

3. Mark varicosity is infrequent. This suggestes that CVI and varicose vein may not be the same disease in some Thai.

4. Most of Thai CVI patients have combined superficial and deep venous reflux.

5. The presence of pulsatile venous flow is found.

Potential conflicts of interest

None.

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ลักษณะทางคลินิกของผู้ป่วยโรคหลอดเลือดดำชาวไทย

บูรพา กาญจนบัตร, เฉนียน เรืองเศรษฐกิจ, ไวกูรณ์ สถาปนาวัตร

วัตถุประสงค์: *เพื่อศึกษาลักษณะทางคลินิกของผู้ป่วยโรคหลอดเลือดดำชาวไทย*
วัสดุและวิธีการ: *การศึกษาย้อนหลังจากแบบรวบรวมข้อมูลที่เก็บไปข้างหน้า*
ผลการศึกษา: *จากการศึกษาขา 102 ข้าง ในผู้ป่วยโรคหลอดเลือดดำเรื้อรัง 78 ราย ผู้ป่วยมีอายุเฉลี่ย 59.6 ปี โดยร้อยละ 24.4 9.0 และ 66.7 มีความรุนแรงของโรคตาม CEAP classification ในระดับ C4, C5 และ C6 ตามลำดับ ผู้ป่วย 7 ราย (ร้อยละ 6.9) มีประวัติโรคลิ่มเลือดอุดตันหลอดเลือดดำส่วนลึก (DVT) มาก่อน ผู้ป่วยมีดัชนีมวลกายเฉลี่ย 26.9 และผู้ป่วยร้อยละ 42 ใช้เวลาทำงานมากกว่าร้อยละ 75 ในท่ายืนหรือเดิน ในขาโรคหลอดเลือดดำเรื้อรัง 90 ข้างที่เป็นที่ไม่เคยได้รับการผ่าตัดรักษามาก่อน มีค่าเฉลี่ย venous clinical severity score เท่ากับ 9.8 และ venous disability score เท่ากับ 0.9 ในผู้ป่วย C4, C5 และ C6 มีค่าเฉลี่ยของ venous clinical severity score เท่ากับ 7.1,7.0 และ 12.1 ตามลำดับ อาการปวดพบในผู้ป่วยร้อยละ 50 และมีความสัมพันธ์กับการเกิด venous eczema จากการตรวจหลอดเลือดดำด้วย duplex Doppler ultrasound พบว่าร้อยละ 80.0 มีการรั่วของหลอดเลือดดำส่วนลึก และร้อยละ 63.3 มีการรั่วของหลอดเลือดดำส่วนตื้น โดยร้อยละ 57.8 มีการรั่วของหลอดเลือดดำส่วนลึกและส่วนตื้นร่วมกัน นอกจากนี้ยังพบการไหลของเลือดเป็นจังหวะในหลอดเลือดดำในขาร้อยละ 3.3 มีขาเพียงร้อยละ 50.0 เท่านั้นที่ตรวจพบหลอดเลือดขอด*
สรุป: *ผู้ป่วยโรคหลอดเลือดดำเรื้อรังชาวไทยมีอาการปวดไม่รุนแรง และแม้ว่าผู้ป่วยน้อยรายจะมีประวัติโรคลิ่มเลือดอุดตันหลอดเลือดดำส่วนลึก แต่กลับตรวจพบการรั่วของหลอดเลือดดำส่วนลึกในสัดส่วนที่สูง และมักจะเกิดร่วมกับการรั่วของหลอดเลือดดำส่วนตื้น การรั่วของหลอดเลือดดำมักจะพบใต้เข่ารอบบริเวณแผลหลอดเลือดดำเรื้อรัง แม้ว่าจะตรวจร่างกายพบหลอดเลือดขอดได้น้อย แต่ผู้ป่วยเหล่านี้จะมีการรั่วของหลอดเลือดดำส่วนตื้นเป็นส่วนใหญ่*
