Clinical Neuroscience & Neurological Research International Journal
ISSN: 2689-6001

Academic Strive
Researcher's perception is our reality

Research Article *Volume 5 Issue 1*

Deep Vein Thrombosis in Parkinson's is Quite Hazardous and Risky

Venkateshwara RR[1-3]*

[1]Department of Neurology, CMR College of Engineering & Technology, India

[2]Department of Neurology, CMR Institute of Medical Sciences, and CMR Hospital, India

[3]Department of Neurology, Nizam's Institute of Medical Sciences, and NIMS Hospital, India

***Corresponding author:** Venkateshwara Rama Raju, Department of Neurology, CMR College of Engineering & Technology, Kandlakoya, India, Tel: 09701697096; Email: drvenkateshwararrr@gmail.com

Received Date: July 08, 2024; **Published Date:** July 23, 2024

Abstract

Background: Lower extremity discomfort is the main proven manifestation of venous thrombosis (VT) plus core illness in specific patients with early Parkinson's disease (PD). Once VT triggers pulmonary embolism, the blood-clot probably may risk the PDs lifespan. Objective: Thus we researched the occurrence of deep-vein thrombosis (DVT) plus its likely correlation though clinical and/or diagnostic research lab-types. Methods: With ultra-sonography, within 117initial-stage Parkinson`s, 11(9.4%) cases noticed through DVT + 106(90.6%)without DVT (Figures 1 & 2). difference shown (Figure 3). Not many changes linking the cases by DVT and not by DVT in gender, body-mass-index, smoking and drinking habits, hypertension, diabetes, sugar history of 'atrial-fibrillation', tumor, also lab tests connected with VT. Parkinson`s through the DVT were by elder ages plus excessive levels of d-dimers.

Results: The echo region of right-side substantia nigra ultrasound in Parkinson`s by DVT was drastically spread, however, there was no sizable variation in left-side. Besides, Parkinson`s through the DVT ensured greater stage H and Y grades and UPDRS-III scores, whereas open stage UPDRS-III scores and cognition >5 and levodopa had lower rates of progression in UPDRS-III. The dose of levodopa for treatment within Parkinson`s through DVT was much reduced. Age duration, D - d dimer levels, plus low-dose levodopa were key risk-factors for lower-extremity venous thrombosis. In elderly and early Parkinson`s, it is essential to do d - dimer and lower-extremity vascular-ultrasound tests. Prevention of VT of the minor-extremities Parkinson`s is particularly beneficial. Correlation by level of d-d dimer in medroxyprogesterone-test showed in (Figure 4) but no significant correlation amid age+LED concentration (Figure 5). Table1 summarizes significant reduction by levodopa. Table2, 3, and 4 is Binary logistic regression analysis in relation to LEVT about history, examinations, drugs and its efficacy.

Conclusion/clinical significance: we recommend that for initial-phase Parkinson`s, D - dimer + lower extremity vascular ultra-sonography is good for aged (elderly>65) patients. Initial imaging/screening-test, timely discovery, promptly-prognosis +early clinical management are most significant for early-stage patients to thwart the progression of lesser-extremity VT, which could avert the occurrence of cancerous outcomes.

Keywords: Deep-Vein Thrombosis; Early-Stage; Initial-Phase; Parkinson's Disease; Risk; Ultrasonography

Abbreviations

PD: Parkinson's Disease; DVT: Deep-Vein Thrombosis; BMI: Body-Mass-Index; H-Y: Hoehn-Yahr; CI: Cognitive-Impairment; CD: Cognitive Dementia; UPDRS: Unified Parkinson's Disease Rating Scale; LED: Levodopa Equivalent Dose; SN: Substantia-Nigra; CDFI: Color Doppler Flow Imaging.

Introduction

Parkinson's disease (PD) is a complex neurodegenerative disease characterized by core motor symptoms, namely, resting-tremor, akinesia, muscle-rigidity and postural instability (balance disorders). The main clinical manifestations of venous thrombosis of the lower extremities include leg swelling, pain, and superficial varicose veins. Although minor extreme deep-vein thrombosis (DVT) is described as a disorder with abnormal clots of lower extremity venous thrombosis, a subset of patients is unable to recognize them as quickly as possible because of lacking the corresponding clinical signs and symptoms. Patients are jeopardized if the thrombus is displaced and causes pulmonary embolism. Till date, the DVT is approximately 0.16% (in the over- all/wide-ranging populace), plus occurrence-of-DVT is higher in PD patients than in common people, yet it's higher in PD patients than in the general population (usual conventional and typical).

Advanced PD patients with postural imbalance, especially during bedridden, are at significantly intensified threat of VT of the lower extremities [1]. A series of abnormal muscle contractions caused by bradykinesia and increased muscle tone in early PD patients may also limit the pumping function in the lower extremity muscles, resulting in impaired venous return [2]. It has been documented that the contraction-relaxation cycle of the muscle pump promotes the return of venous blood. As long as the muscle pump is lost, the stagnant flow between the venous valves and the blood vessel wall stalls, leading to thrombosis. A meaningful progression within the probability of thrombosis and the rate of thrombus growth can been shown [2]. In addition, a series of abnormal muscle contractions caused by increased muscle tone limits muscle pump function, attributing to impaired venous blood return and leading to the formation of venous blood clot. DVT might progress in to constant-pain, leg vein ulcers and long- term disability with post-thrombotic syndrome [3]. Abnormal blood flow causes paresthesia and even pain, leading to a reduced quality of life. This is also important in non-motor symptoms.

In addition, DVT in the lower extremities can actually cause pulmonary embolism, which increases mortality in patients [4]. If early prophylaxis plus conduct of management of smaller limit VT is employed, the social function and quality of life of PD patients will be improved, hazardous casualty in PD patients will be greatly reduced. Taken together, DVT is a significant factor within the progression of PD, but there is insufficient reported evidence related to its risk factors.

Purpose was to evaluate the incidence of lower extremity venous thrombosis in early stage of PD, possible scientifically pertinent 'risk-factors' for developing DVT in Parkinson`s by early PD (age, gender, years-of-on-set, body-mass-index(BMI), smoke-smoldering (cigarette, ciggy, etc.) and alcohol habits, etc.), test results (lipids, glucose, D-dimers, and platelets, etc.), dyskinesia, and medication factors (on- and off-phase motor scores, Hoehn-Yahr (H-Y) staging, and improvement rate on the methyldopa loading test, etc.). Notably, our study might cause and provide to compensate for the lack of research on 'risk-factors' for VT (in early PD). Additionally, our investigation may also improve the progression in PD patients through early prevention and treatment.

Aims and Objectives

Deep vein thrombosis (DVT) is often predisposed to by advanced age, fractures, braking, pregnancy, malignancy, and use of oral contraceptives. It has been reported that the common disease of peripheral blood vessels is caused by abnormal blood clotting blocking deep vein vascular lumen, resulting in venous return obstruction [5]. Thus, acute stroke has a high risk of DVT, in which limb weakness, immobility and even bed-ridden-ness are 'risk—factors' for the development of DVTin neurological diseases [1]. So it can be noted that advanced Parkinsonians may be at risk of developing DVT because balance disorders can drastically reduce their mobility and may even require wheelchairs or even bed rest [6]. However, early-stage PD patients with DVT are now rarely reported. Therefore, this study aims to analyze risk factors for early-stage Parkinson disease via Deep vein thrombosis.

Methods

Parkinsonian Subjects

This was a cross-sectional study. We included patients with (117) or without (80) PD diagnosed at our tertiary care Hospital between 2019-2023. Basic info of all the subjects were acquired, which includes the persons-age, sex (gender-male/female), plus past medical history. All the enrolled subjects plus relatives 'informed-consent' prior to the study obtained through the forms. The inclusion criteria is: 1. The patients' diagnoses met the standard of the 2015 ICDC of Parkinson's disease, and patient who met the PD diagnosis was classified as H-Y 1-2.5 stage, 2.The

patient signs an agreement to participate in the program. Conversely, the exclusion criteria were: the patient had 1. An active malignancy; 2. Earlier venous-thrombo embolism, 3. immobilization rest >72 hours due to physical reasons, 4. thrombophilia or blood system diseases, 5. Acute myocardial infarction, heart failure, 6. Acute cerebral infarction, 7. Acute respiratory failure, 8. Acute infection or rheumatic disease, 9. Hormones—application, and lastly 10. Cognitive—disorders like cognitive- impairment (CI), cognitive-loss, cognitive dementia(CD), memory non motor symptoms.

Judgments

Patients were evaluated after admission, including laboratory tests, ultrasound, and scale assessment. Fort laboratory tests, SYSMEX XN-9000 Hematology Analyzer and supporting reagents utilized as a regular testing-of-blood. Abbott c16000 biochemical analyzer and matching reagents utilized in biochemical testing's. The coagulation function was measured by ACL TOP 750 LAS coagulation analyzer and matching reagents. Scales included the Hoehn-Yahr (H–Y) stage, the Unified Parkinson's Disease Rating Scale (UPDRS) III in off and open stage, the improvement rate in UPDRS III on treatment with levodopa, and daily levodopa equivalent dose (LED). Assessments were performed by physicians with uniform training criteria. Ethical clearance following Helsinki principles was done.

Ultrasound (Sonography/Ultrasonography) Testing (Echography)

The subjects with 'lower-limb'vascular was ultra sound. The ultrasonic diagnostic criteria for DVT [7] was through the deep-vein in 'lower-limb' crus-side tube-cavity acoustic, visible-hypoechoic and/or low-echo mas- packing, color doppler ultrasound display tube-cavity no blood-flow-signals or tube-cavity filling-defect. The mid brain substantia-nigra (SN) ultra sound was done by applying 'phase array probe' ultra sound diagnostic tool (instrument,2.6 MHz, whose depth was 14-16), pixel resolutions dynamic-ranges 45 dB to 55 dB. The probes were located within the left (L) and right® temporalWindows, off to the skin and parallel to the aurical-orbital line, in L and R cross/lateral-decubitus site for sector probing (scan screening), plus customary portion was achieved. The imageries were freezing (frozen-up) also enlarged to detect as well as determine the every anatomical-limbic-structure.

Clinico-Statistical Analysis

Clinico-statistical tests such as chi-square, t-tests, Pearson's correlation, analysis of variance(σ, ANOVA), fishers f-test, etc. conducted. Statistical significancy measured by considering $p<0.05$. The statistical computations were represented as mean±SEM.

For differentiating amid the two cohorts, the t-test was done. The correlation (ρ) amongst two factors were evaluated through the easy but elegant 'linear-analysis'. Corresponding 'risk-factors' were computed through the binary logistic-regression.

Results and Discussion

The Minor-Extreme DVT

Subjects who moaned of 'lower-extreme' bumping/swelling and pain were tested at the interval of demonstration in lower-extreme arterial-ultra-sound to rule out thrombotic-factors (n=197). Of note, the lower-extreme arteriovenous ultrasound was detected in early PD patients with DVT (n=11, 9.4%) but not seen in early PD patients without DVT (n=106, 90.6%) (Figures 1 & 2). The results suggest the reduce extreme deep-venous thrombosis seems through the DVT.

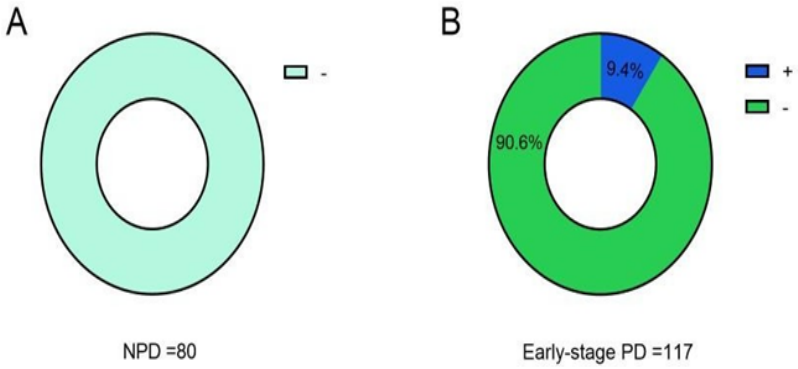

Figure 1: The occurrence of D V T in the initial Parkinson disease stage. [A] Parkinson p/t`s with no disease~80cases didn`t get the D V T, [B] early Parkinson p/t`s through the initial-phase~117 cases, the D V T was detectible within the 11cases.

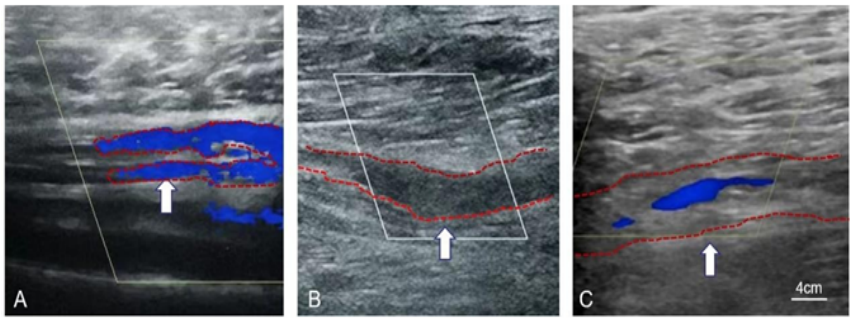

Figure 2: Descriptive graphs of color doppler-ultrasound (CDFI). [A] Usual image, colored CDFI lower-limb calf crosswise deep-vein(DV) lumen completely occupied through signals of blood- flow-signals [B] the D V T illustration, hypo echophore fillings perceived within the lumen of the DV on the lower-side of leg, no blood-flow signal observed in CDFI, [C] the DVT illustration, the echophore close to tube-wall examined in DV of lower-side of leg, plus blood-flow filling-defect observed in CDFI-lumen. The scaler bar~4cm diameter length.

Big Differences Amid Early Parkinson's

Out of117cases of initial PD stage, the 11cases were uncovered through the D V T plus106 cases without DVT. No differentiation amongst initial Parkinson`s through or with no D V T within the basic clinic-features in footings of in standings of sex (gender-male/female), number-of-years of experience, BMI, spirits plus baccy, tobacco use, hyper tension history, diabetic-sugar, 'atrial-fibrillation (saw-tooth potentials), or cancer-tumors, Yet, through the contrast, Parkinson`s by the DVT were noteworthy through elderly-ages, the complex contented of d-ddimers, that were linked-up through the thrombosis within lab test pointers, even though no alterations there in the other laboratory tests. At the same time, the nigrostriatal ultrasound demonstrated the echo area of the right nigrostriatal ultrasound within the Parkinson`s by the DVT was seen substantially superior. No differentiations amongst echo area of the left nigrostriatal ultrasound and the ultrasound width of the third ventricle. PD-related assessment metrics furthermore exhibited that Parkinson p/t`s by the D V T had a higher HY classification and higher UPDRS III off-phase scores. However, the UPDRS III score in open phase and the improvement rates in UPDRS III on treatment with levodopa were lower. The dose of levodopa used for treatment within Parkinson p/t`s through the D V T was substantially reduced, which was summarized in Table1.

	LEVT (+)	LEVT (-)	*P value*
Case Numbers	11	106	
Age(year)	75.09 ± 1.124	66.36 ± 0.74	0.001*
Gender (F:M)	2.67	0.8	0.073
BMI	23.34 ± 1.01	23.54 ± 0.25	0.812
Duration(year)	3.86 ± 0.86	2.8 ± 0.29	0.267
H-Yahr stage	2.36 ± 0.07	1.82 ± 0.05	0.002*
LED (mg/day)	246.6 ± 42.44	299.8 ± 15.07	0.274
History of Hypertension (HTN)	7(63.3%)	50(47.17%)	0.298
History of Diabetes Mellitus (DM)	2(18.2%)	13(12.26%)	0.576
History of atrial fibrillation	0	3(2.8%)	0.572
History of smoke	1(9.09%)	13(12.26%)	0.758
History of wine	0	14(13.21%)	0.199
History of cancer	1(9.09%)	2(1.89%)	0.15
Triglyceride (TG, mmol/L)	1.1 ± 0.12	1.37 ± 0.09	0.308
Cholesterol(mmol/L)	4.27 ± 0.22	7.06 ± 2.83	0.729

Blood platelet (PLT,10^9/L)	181.9 ± 17.46	183.0 ± 5.77	0.638
D-dimer (DD, mg/L)	1.41 ± 0.6	0.49 ± 0.06	0.001*
Activated partial thromboplastin time (APTT, s)	30.08 ± 0.56	29.02 ± 0.26	0.183
Substantia nigra echo area left（cm^2）	0.12 ± 0.05	0.12 ± 0.02	0.74
Substantia nigra echo area right（cm^2）	0.20 ± 0.06	0.1 ± 0.01	0.048*
Diacele echo length (cm)	0.95 ± 0.51	0.49 ± 0.03	0.344
UPDRS3(close)	53.09 ± 5.08	34.58 ± 1.8	0.002*
UPDRS3(open)	40.91 ± 4.53	23.08 ± 1.45	<0.001*
Improvement rate (%)	22.6 ± 3.73	35.63 ± 1.66	0.015*

Table 1: Over all clinical findings in the LEVT -positive and negative early-stage PD patients.

The difference was illustrated in Figure 3.

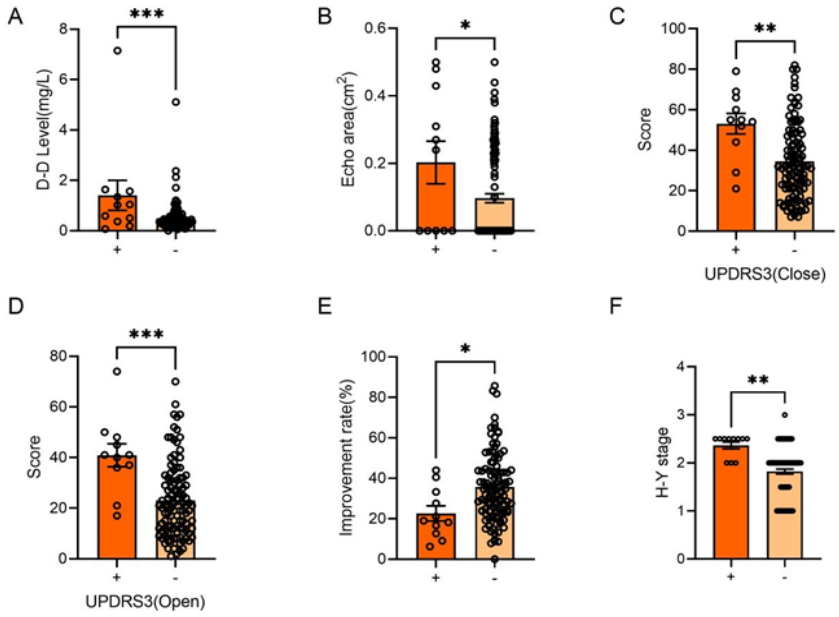

Figure 3: Clinical—results in DVT+Ve plus -Ve (negative) initial Parkinson`s phase (p/t`s). The level of D-D [A], the signal/noise-ratio(SNR) echo region [B], UPDRS- stage3-scores OFF [C] UPDRS-stage3 scores ON, [D] rate of progression [E], H and Y stage-scores>5 [F] was meaningful and suggestive difference within D V T +Ve initial Parkinson`s -phases. +, DVT +Ve initial Parkinson`s phases, 1cases, -, DVT - Ve initial Parkinson disease p/t`s, 106cases acordingly.

Data analysis implies that initial Parkinson p/t`s are elders>62yeras, the larger contents of d-ddimers plus UPDRS-stage(III) OFF-phase scoring through considerable contrasts.

Risk Factors Associated with DVT in Early-Stage PD Patients

Regression was done to examine the 'risk-factors' connected through the deep-vein thrombosis in early and initial phase Parkinson`s. the evaluation revealed clinical basic characteristics include gender, years of disease, body mass index, tobacco and alcohol addiction, hypertension, diabetes, atrial fibrillation plus lumps were non 'risk- factors` for lowerlimb venous-thrombosis that contained deep-vein-thrombosis(DVT) , excluding for stage or phases-of-age. Elderly (aged) p/t`s are coupled through the high-risks-of DVTs (Table 2).

	Odds ratio	95% CI	*P* value
Age(year)	1.393	1.122-1.728	0.003 *
Gender	0.391	0.065-2.333	0.303
BMI	1.115	0.849-1.464	0.433
History of HBP	0.464	0.088-2.438	0.364
History of DM	0.584	0.056-6.078	0.653
History of atrial fibrillation	61876825.7	0	0.999
History of smoke	0.514	0.018-14.608	0.697
History of wine	66128790.47	0	0.998
History of cancer	0.055	0-7.669	0.25

Table 2: Binary logistic regression analysis in relation to LEVT about history.

Differentiation was high in the substance of d-ddimers, plus high-levels of d-ddimers were connected through the high-risk of theDVT. The other laboratory tests, including the nigrostriatal ultrasound (Table 3), HY classification, switching period score of the UPDRS, and the improvement rate in UPDRS III on treatment with levodopa in PD- related assessment metrics, were not differentially expressed in p/t`s through the DVT or with no DVT, thus not measured and well-thought-out and not reflected as "risk- factors".

	Odds ratio	95% CI	*P* value
TG (mmol/L)	0.591	0.182-1.923	0.382
Cholesterol(mmol/L)	1.001	0.882-1.136	0.986
PLT (10^9/L)	1.001	0.990-1.013	0.831
D-D(mg/L)	1.936	1.005-3.729	0.048*
APTT(s)	1.237	0.919-1.667	0.161
Substantia nigra echo area left（cm^2）	0.229	0.002-29.810	0.553
Substantia nigra echo area right（cm^2）	41.252	0.466-3653.656	0.104
Diacele echo length (cm)	0.31	0.028-3.422	0.339

Table 3: Binary logistic regression analysis in relation to LEVT about examinations.

While HY grading showed an indicative trend for the risk of DVT, the concentration of levodopa used in treatment in this study it's a risk factor for theDVT (Table 4). Hence, findings reveal that; age' plus 'd-ddimer' contented levo dopa dose are the key risk factors in theDVT.

	Odds ratio	95% CI	*P* value
Duration(year)	1.056	0.831-1.343	0.656
H-Yahr stage	10.6	0.956-117.552	0.054
LED (mg/day)	0.993	0.987-0.999	0.031*
UPDRS3(close)	1.203	0.893-1.621	0.224
UPDRS3(open)	0.817	0.560-1.192	0.294
Improvement rate (%)	0.853	0.686-1.062	0.156

Table 4: Binary logistic regression analysis in relation to LEVT about drugs and its efficacy.

Correlation of Disease Duration, Age, D-D Dimer Content, Scale Evaluation and LED Concentration in Early-Stage PD Patients

In early-stage PD patients, the duration of the illness was definitely connected through the H and Y grades>5, UPDRS switching period score and LED dosage, yet uncorrelated d-ddimer levels or rate-of progression within the medro xypro gesterone testing's (Figure 4).

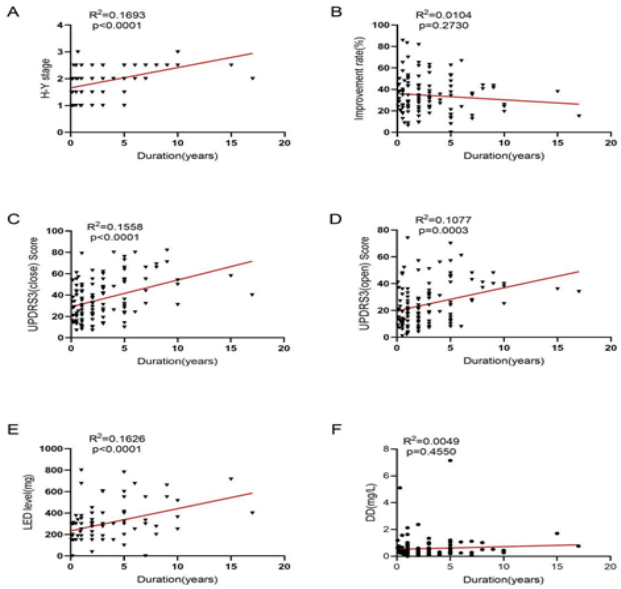

Figure 4: Early PD patients during the time plus H and Y scoring-stage [A] progress-rate [B] UPDRS-stage3 scores were-OFF [C] as well as UPDRSstage-3 were ON [D], level of electrodes [E], also levels of D-Ds [F] of relevance.

Dissimilarly, the aging was certainly interrelated through the d-ddimer content, H and Y score grading, UPDRS switching period scores, but negatively correlated with the improvement rate in UPDRS III on treatment with levodopa in early-stage PD patients. Interestingly, there was no significant correlation between age and LED concentration (Figure 5).

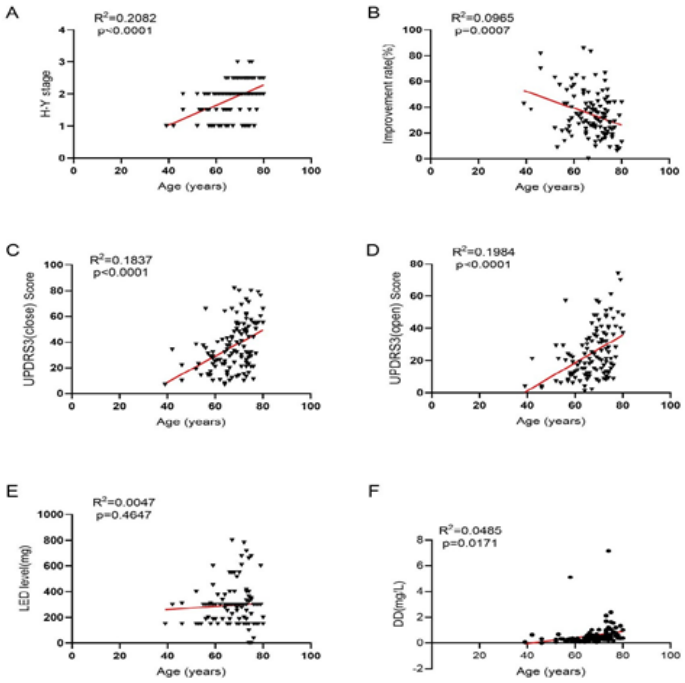

Figure 5: Early Parkinson p/t`s during the age-phase and H and Y score stages [A] progress-rate, [B] UPDRS-stageIII scoresoff [C] and UPDRS-stageIII begin [D], level-of-electrode [E] plus the level-of D-D [F] of significance.

Taken together, it`s apparent and quite sure that the dose of electrode doesn`t have a substantial impact over the length of the disease. When the earlier PD is detected, the earlier treatment has a more significant effect on drug improvement.

Deep vein thrombosis (DVT) is often predisposed to by advanced age, fractures, braking, pregnancy, malignancy, and use of oral contraceptives. Previous experiments shows the common disease of peripheral blood vessels is caused by abnormal blood clotting blocking deep vein vascular lumen, resulting in venous return obstruction [5]. Thus, acute stroke has a high risk of DVT, in which limb weakness, immobility and even bed riddenness are riskfactors in the development of minimal extreme DVT in neurological diseases [1]. Thus, it may be noted that subjects with idiopathic Parkinson disease may be at risk of developing DVT because balance disorders can drastically reduce their mobility and may even require wheelchairs or even bed rest [6]. However, early-stage PD patients with DVT are now rarely reported. Therefore, our study aims to analyze riskfactors in early-stage PD with DVT.

We have discovered that the incidence of DVT is as high as 9.4% in patients with early PD, while there is no DVT occurred in non-PD patients. Elders are further liable to develop DVT, while gender, age of onset, body mass index, tobacco and alcohol addiction, hypertension, diabetes, atrial fibrillation, and cancer and lump aren`t linked through the progression of DVT. The results show higher levels of d-d dimer in VT subjects' worse extremities, and there are no differences in the rest of the laboratory tests associated with thrombosis. Similarly, it`s discovered that the echo area of the right nigrostriatal ultrasound is significantly higher in subjects minor extreme VT in nigrostriatal ultrasound, although there was no noteworthy variance between the echo area of the left nigrostriatal ultrasound and the width of the ultrasound of the third ventricle. Subjects through the minor extreme VT have a higher HY stage, higher UPDRS III off-phase scores, lower open-phase UPDRS III scores and the improvement rate in UPDRS III on treatment with levodopa, suggesting that the worse the motor function, the greater the likelihood of developing DVT. The dosage of levodopa (LED) used in therapy is significantly lower in subjects by minor extreme VT. A dichotomous regression (logistic) technique was done to analyze the associated risk factors in our study. Findings showed that age, content of d-d dimer and low levodopa dosage are main risk factors for lower extremity venous thrombosis. The results of linear correlation analysis suggest that the dosage of LED has no significant effect on the duration of the disease. The earlier the PD is detected, the earlier the treatment, the more significant the improvement of the drugs.

Patients with early-stage PD do not have balance disorders, but bradykinesia, myotonia, and increased muscle tone in the limbs are the core symptoms [8]. Myotonia is a bidirectional resistance throughout the entire range of motion and may involve simultaneous contraction of both active and antagonistic muscles. A series of abnormal muscle contractions caused by increased muscle tone limits muscle pump function, leading to impaired venous blood return, resulting in the formation of venous blood clots [9]. Motor retardation consists of muscle weakness, rigidity, tremor, motor variability, and slowed thinking. Physiological differences in EMG activity in patients compared to normal subjects suggest that voluntary contraction dynamics are organized differently than usual [10]. The differences manifested the contractile function of their muscle pumps was also affected [2]. Hence, bradykinesia also leads to an increased likelihood of thrombosis. Thus, the study indicates that there is a pathophysiological basis for the occurrence of lower extremity venous thrombosis in early PD patients.

Simultaneously, we examined that all DVT in Parkinsonians through early disease is distal DVT below the knee. Distal DVT is a thrombosis isolated to the veinsof down leg [11]. In contrast, the manifestations of DVT within distal extremity are asymptomatic [12]. Furthermore, it is easily overlooked and requires early screening, detection, diagnosis and treatment to avoid the possibility of thrombus dislodgement leading to pulmonary embolism. Also, we examined that age is a much more riskfactor in the development of DVT in Parkinsonians through the early-stage PD. The older the patient, the greater the riskof minor extreme VT, even though earlier information have not relinquished the identical outcomes [6]. It might be correlated the stage of the disease course of the PD patients it included in the target population. While previous study included PD patients with whole H-Y stages, our study only included early-stage PD patients.D-dimer is the most commonly used and simple biomarker for the evaluation of systemic venous thrombosis [7].

Conclusion

This study discovered that D-dimer is significantly higher in the DVT-positive group than that in the DVT-negative group. D-dimer can also be used as a riskfactor in DVT in Parkinsonian subjects through the early-stage PD, therefore, it is necessary to screen D-dimer in such patients. Yamane et al. have reported results suggest that D- dimer is not meaningful. D-dimer may be more important in predicting DVT within the Parkinsonians through the early-stage PD. In just mid and late stage of PD, the pathological damage is wider and deeper, and the confounding factors are further composite, and might not be suggestive. We have also found that transcranial sonography in the DVT-positive group shows a large area of hyper-echogenicity in the substantia nigra on the right side. The reports and evidence of its correlation are not sufficient, and the reasons cannot be explained at

present. It is necessary to increase the sample size to find more positive patients for analysis. Yet, this spectacle hints that we can perform transcranial ultrasound at an early stage and find that the substantia nigra echo is helpful to screen patients with positive DVT. In addition, although the binary logistics regression analysis in the H and Y score stages were statistically not significant, and the riskfactor trend (P=0.054). The comparison between DVT positive group and DVT negative group suggests that the stage of the positive group was more advanced. Yamane et al. [6] reported that correlation was not significant amid H and Y stage and DVT (P=0.15). It may be related to the fact that the patients he enrolled were in whole HY stages, while our study were in stages 1-2.5. The sample sizes of the two studies are separate and were not the same, but both were small and required elect confirmed by more samples.

The UPDRS-III scores in both on and off phase do not suggest an association with DVT. The regression analysis of the correlation between drug treatment and DVT do not suggest that the UPDRS-III scores is a risk factor. The findings of direct correlation results implies that the dose of LED has no significant effect on the duration of the disease. For earlier PD, the earlier treatment has a more significant effect on the improvement of drugs. Simultaneously, the levodopa equivalent dose is lower in the DVT positive cohort, advocating that better dosages of therapeutic drugs are needed to improve motor symptoms and reduce the incidence of DVT. At present, thrombolysis, anticoagulation, and intravascular therapy [11,13] and [5] are the main treatments for thrombosis. There is insufficient evidence about whether dopaminergic drugs reduce or treat DVT in early PD patients. There are also some limitations. The overall number of cases, especially the number of DVT-positive cases, is not enough. The classification of lesser extreme DVT was not there, which might be dissimilar risk factors in diverse kinds of VTs. Assessment of improvement within the Parkinsonians through the post-treatment thrombosis is lacking. These aspects could be improved to get more objective results in the future [13-18].

And thus finally, we conclude that for initial-phase Parkinson`s, D - dimer + lower extremity vascular ultra sonography is good for aged (elderly>65) patients. Initial imaging/screening-test, timely discovery, promptly-prognosis + early management are most significant for early-stage patients to thwart the progression of lesser-extremity VT, which could avert the occurrence of cancerous outcomes.

References

1. Tondel BG, Morelli VM, Hansen JB, Braekkan SK (2022) Risk factors and predictors for venous thromboembolism in people with ischemic stroke: A systematic review. J Thromb Haemost 20(10): 2173-2186.
2. Hu X, Li Y, Li J, Chen H (2022) Effects of altered blood flow induced by the muscle pump on thrombosis in a microfluidic venous valve model. Lab Chip 20(14): 2473-2481.
3. Kahn SR (2016) The post-thrombotic syndrome. Hematology Am Soc Hematol Educ Program 1: 413-418.
4. McLendon K, Amandeep G, Attia M (2023) Deep Venous Thrombosis Risk Factors. StatPearls, In: StatPearls Publishing, Treasure Island.
5. Kim KA, Choi SY, Kim R (2021) Endovascular Treatment for Lower Extremity Deep Vein Thrombosis: An Overview. Korean J Radiol 22(6): 931-943.
6. Yamane K, Kimura F, Unoda K, Hosokawa T, Hirose T, et al. (2013) Postural abnormality as a risk marker for leg deep venous thrombosis in Parkinson's disease. PLoS One 8(7): e66984.
7. Bhatt M, Braun C, Patel P, Parth P, Begum H, et al. (2020) Diagnosis of deep vein thrombosis of the lower extremity: a systematic review and meta-analysis of test accuracy. Blood Adv 4(7): 1250-1264.
8. Regnault A, Boroojerdi B, Meunier J, Bani M, Morel T, et al. (2019) Does the MDS-UPDRS provide the precision to assess progression in early Parkinson's disease? Learnings from the Parkinson's progression marker initiative cohort. J Neurol 266(8): 1927-1936.
9. Sanger TD, Delgado MR, Spira DG, Hallett M, Mink JW, et al. (2003) Classification and definition of disorders causing hypertonia in childhood. Pediatrics 111(1): e89-97.
10. Berardelli A, Rothwell JC, Thompson PD, Hallett M (2001) Pathophysiology of bradykinesia in Parkinson's disease. Brain 124(11): 2131-2146.
11. Kakkos SK, Kirkilesis G, Bicknell C, Salim S, Kakavia K (2020) Treatment of distal deep vein thrombosis. Cochrane Database Syst Rev 4(4): Cd013422.
12. Shimabukuro N, Mo M, Hashiyama N, Matsubara S, Nemoto H, et al. (2019) Clinical Course of Asymptomatic Isolated Distal Deep Vein Thrombosis of the Leg: A Single-Institution Study. Ann Vasc Dis 12(4): 487-492.
13. Broderick C, Watson L, Armon MP (2021) Thrombolytic strategies versus standard anticoagulation for acute deep vein thrombosis of the lower limb. Cochrane Database Syst Rev 1(1): Cd002783.

14. Ghit A, Deeb HE (2022) Cytokines, miRNAs, and Antioxidants as Combined Non-invasive Biomarkers for Parkinson's Disease. J Mol Neurosci 72(5): 1133-1140.

15. Altamirano JLC, Long SR, Bandala C, Varela AM, Jaime HB, et al. (2022) Neuropathic Pain in Parkinson's Disease. Neurol India 70(5): 1879-1886.

16. Schick MA, Pacifico L (2023) Deep Venous Thrombosis of the Lower Extremity. StatPearls, In: StatPearls Publishing, Treasure Island.

17. Essien EO, Rali P, Mathai SC (2019) Pulmonary Embolism. Med Clin North Am 103(3): 549-564.

18. Waheed SM, Kudaravalli P, Hotwagner DT (2023) Deep Vein Thrombosis. StatPearls, In: StatPearls Publishing, Treasure Island.