

# Increased Risk of e-Thrombosis in e-Life Era

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e-thrombosis, Covid-19, pandemic, isolation, immobilization, thromboembolism

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## Increased Risk of e-Thrombosis in e-Life Era

With the COVID-19 Pandemic, significant differences continue to emerge in modern life, and new problems arise as a result of the gross measures taken. The way of learning, communicating and working have changed leading to an almost virtual existence. Social distancing was one of the first concepts that was developed, implicating a shade of sympathy, but after a year of experience, its meaning was transformed to desolate existence. With the shifting pattern of this living, an overt increase was observed in the incidence of dementia, depression and anxiety.<sup>1</sup> Eating patterns including stressful eating, prolonged seated position during work and education shall alert us for thrombotic events as Beasley and coworkers have described as “e-thrombosis” for the first time in 2003.<sup>2</sup> At that time, they have reported concerns for the increasing use of computers for both entertainment purposes (computer games, etc.) and sitting inactively for hours might dramatically increase the epidemiological burden of thrombosis. To support this perspective, they have presented a case of a 32-year-old with acute pulmonary thromboembolism after sitting in front of a computer consistently for 18 hours.<sup>2</sup> The perspective of such immobility may trigger thrombosis is consistent with the timeless Virchow’s Triad (abnormal blood constituents, abnormal vessel wall, abnormal blood flow), which Rudolf Virchow has defined in the 19th century.

Before the suggestion of the term e-thrombosis, Simpson has reported cases seeking shelter and remaining immobile for days during the World War II which later developed thrombosis. Likewise, another entity indicating an increased risk of thromboembolism after prolonged immobilization is “traveler’s thrombosis” also known as “economy class syndrome” due to long haul flights. Supporting these reports, oxidative stress and endothelial dysfunction were demonstrated to be increased with blood pooling in the calves and decreased lower extremity blood flow in persons with sedentary lifestyle. Based on these combinations of perspectives, “seated immobility thromboembolism (SIT) syndrome” has been introduced to encompass all conditions in which a state of prolonged sitting is found to be the major risk factor in patients presenting with venous thromboembolism.<sup>2,3</sup>

Today, with the inevitably increasing use of computers, we are facing the evolved concept of the aforementioned ones, “e-thrombosis” with an accumulating data. In a cohort study including 105564 persons of an occupational database by Sua-dicani et al,<sup>4</sup> sedentary working conditions are demonstrated to increase the frequency of pulmonary embolism. Likewise, in a cross-sectional study focusing on work/computer usage related immobility for hours, Braithwaite et al<sup>5</sup> reported an increased VTE risk with a 1.08-fold per hour.

It may be expected that thromboembolic events will become more common with the increased use of personal computers. With the measures taken because of COVID-19 pandemic and people being bound to live more sedentarily, this disease will become much more common. Education systems also have changed since 2020 and classical education may also be abandoned and may evolve to “e-schools.” Such a transformation will certainly bring an increased immobility, eating disorders, psychosocial problems in generations who were already struggling with increased use of games and social media. Although the frequency of VTE is lower in children and adolescents compared to adults, immobilization becomes an additional contributing factor in people with various underlying risk factors for thromboembolism.

In order to minimize this risk at home; we shall advice design and setup an ergonomically suitable computer workstation, use a comfortable sitting position (avoid maintaining a position of crossed legs), stand up every 60 min and walk around for 5-10 min or perform exercise on both (extend the leg and move the foot back and forth, put the foot on the floor and point upward), or walking programed and repetitive way which is also recently called as home walking with step counting, avoid from wearing

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tight clothing that may compromise the blood flow of extremities, reduce the use of computers or televisions except for work or study, avoid using tobacco products.<sup>6</sup> It is important for those who have risk factors to consult with their physicians in terms of using pharmacological prophylaxis. It is imperative for those who are currently receiving anticoagulant therapy or patients with hereditary thrombophilia to continue their regular anticoagulant treatment. It is advised to consult a physician in case of unilateral swelling and/or pain in legs or shortness of breath after prolonged computer use.

As is known, COVID-19 is an important entity for hypercoagulability, microangiopathy and thromboembolism.<sup>7</sup> In our article, we wanted to draw attention to an acquired and preventable risk factor “e-thrombosis” besides COVID-19 itself, which may increase with online education, working from home and long online congresses in the COVID-19 pandemic. In this e-Life period, staying active and mobile daily and exercising at home are important. During the pandemic era, education concerning this topic can be provided for health personnel and the public. In the near future, it will be much more important that the medical communities and health authorities to put more emphasis and frequent mentions on “e-thrombosis.”

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