

Reducing the risk of e-thrombosis

E-thrombosis is a new term, coined by a group of doctors in New Zealand led by Professor Richard Beasley, for the association between sitting at a PC for long periods and the development of **deep-vein thrombosis** (DVT) and then **pulmonary embolism**.

DVT is due to blood clots in the deep veins of the legs and can involve the calf and also thigh veins. Once a clot had entered the thigh, there is about a 10% chance of the clot breaking off and travelling up into the right side of the heart and then through into the lung artery, where it will block blood flow to the lungs. A large pulmonary embolism can block the entire blood supply to the lungs and can be fatal. A smaller one can cause breathlessness and pain and even coughing up blood.

The association between sitting for long periods and deep-vein thrombosis was first recognised in London during the Blitz in World War II, when many people slept overnight in deckchairs. The added pressure of the wooden rung of the deck chair pressing on the back of the leg probably contributed. Travellers' thrombosis is also due to prolonged sitting and is more common in very tall and short people as well as those with other risk factors such as using the combined oral contraceptive pill or travelling when unwell. Professor Beasley has also used the term 'seated immobility syndrome' to cover e-thrombosis, travellers' thrombosis and other conditions where not being able to move around much causes DVT. A recent study showed that just sitting for an hour and a half reduces the blood flow in the popliteal vein (behind the knee) by 50%. This would predispose people to DVT.

The first case of e-thrombosis described by Professor Beasley's group was in a 32-year-old man who developed a DVT and pulmonary embolism after sitting for periods both at work and at home in front of his PC. He regularly sat for 12 hours and sometimes for 18 hours. Sometimes he did not get up and move around for six hours at a time. There has also been a recent legal case in the United States where a man won substantial damages from a large corporation after his 47-year-old wife had a pulmonary embolism after a marathon 10-hour session at her PC to meet a deadline. While this case did involve other risk factors for developing thrombosis, it was judged that it was the extended period of sitting brought about by pressure of work to complete a project which had led to the pulmonary embolism and, her early death.

A man who spent 72 hours in an internet café on a PC playing games also died. More recently a 20-year-old man, Chris Staniforth, who regularly spent 12 hours or more gaming online with others around the world, died from a pulmonary embolism, which the coroner said was brought about by his marathon gaming sessions. Chris's father, David, has set up a website (<http://www.take-time-out.info>) which brings together information about Chris's death and highlights the risks of developing DVT and pulmonary embolism. We are currently working with David to urge the gaming industry to increase awareness about the risks of developing thrombosis from long periods of sitting.

The incidence of e-thrombosis is not known, but may be quite substantial in view of the widespread use of computers at work and at home. In the US in 2005, half of all employees used a PC at work. At the same time, half of all employees also had a PC at home, with increasing access to the internet. There have been several recent articles linking our increasingly sedentary lifestyles (where we spend long periods without walking around or doing exercise) to pulmonary embolism. The reality is that we are spending more and more time, both at work and in our leisure time, sitting for long periods. A study was published in the British Medical Journal recently linking sedentary lifestyles to an increased incidence in pulmonary embolism in women. It found that women who sat for a long time every day had double the risk of a DVT and pulmonary embolism.

Dr Beasley's group have recently shown that being seated at work and on the computer at home, at least 10 hours in a 24-hour period and at least two hours without getting up, is related to an increased risk of DVT and pulmonary embolism. They also showed that for every extra hour at your desk, the risk of clots increases by 10%. A clot is twice as if someone eats their lunch at their desk rather than getting up and eating elsewhere.

If you spend long periods on a PC or a games console, you should do regular foot and leg exercises and have regular exercise breaks away from the PC every 90 minutes. It is also important to stay well-hydrated with regular drinks, as dehydration is another risk factor for DVT.

References

Beasley R and others, eThrombosis: the 21st Century variant of venous thromboembolism associated with immobility. Eur Resp J 2003; 21: 374-376.

Healy and others, Prolonged work and computer-related seated immobility and risk of venous thromboembolism. J R Soc Med 2010 103: 447-454.

In New Zealand, patients aged 18 to 65 who had venous thromboembolism (VTE) filled in a questionnaire and were compared to a matched group of patients admitted to the coronary-care unit with a condition other than VTE. There were 197 patients with VTE and 197 without. Prolonged work and computer-related seated immobility (sitting for more than 10 hours a day, of which at least two hours were without getting up) was associated with an increased risk of VTE. This was 2.8 times greater than the controls. The risk of VTE increased by 10% for each extra hour seated, for both the maximum and average time seated in a 24-hour period. The risk of VTE increased by 20% for each extra hour seated at a time without getting up. However, this was not statistically significant. The risk of VTE was significantly increased (twice as likely) for people with their own desks at work and in those who usually or always ate lunch at their desk as well. The authors suggested that people need to be more aware of the effect sitting for long periods can have on developing VTE, as well as the strategies businesses could develop to reduce the risk.

Hitos K and others, Effect of leg exercises on popliteal venous blood flow during prolonged immobility of seated subjects: implications for prevention of travel-related deep vein thrombosis. J Thromb Haemost 2007; 5: 1890-1895

This study showed that blood flow falls by 50% when a person sits still for 100 minutes with their feet on the floor. There is a further reduction in flow if the person's feet don't reach the floor. This explains why people with short legs are five times more likely to have a DVT on long-haul flights. There was an increase in blood flow when those studied did leg exercises.

Kabrhel C, Varraso R, Goldhaber SZ, Rimm E, Camargo CA Jr. Physical inactivity and idiopathic pulmonary embolism in women: prospective study. BMJ. 2011 Jul 4;343:d3867. doi: 10.1136/bmj.d3867.

Over 69,000 female nurses filled in a questionnaire every two years from 1990 to 2008. There were 268 cases of pulmonary embolism. The risk of pulmonary embolism was more than twice in women who spent most time sitting compared to those who spent the least time sitting (multivariate hazard ratio 2.34, 95% confidence interval 1.3-4.2). They decided that physical inactivity is associated with pulmonary embolism in women. As a result, action aimed at reducing time spent sitting could lower the risk of pulmonary embolism.

Lindqvist PG and others, The relationship between lifestyle factors and venous thromboembolism among women: a report from the MISS study. Brit J Haematol 2008; 234-240

This study of 40,000 Swedish women aged between 25 and 64 involved following them for 11 years. It showed those women who led a sedentary lifestyle were at twice the risk of VTE of those who were active. Heavy smoking increased the risk by 30%, as did being overweight.

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