How Ergonomic are Ball Chairs?

Exercise balls or ball chairs should not be used as a replacement for a good ergonomic office chair. These balls can be used for some temporary sitting possibly to help with some core strengthening, but they fail to provide any back support, especially in the lumbar region which is an essential component of an ergonomic chair. Also, a chair seat pan should be made of a breathable material to transport heat and moisture away from the body but the material of a ball is non-breathable. The following studies have been undertaken on the use of balls and the results show that these are not a replacement for an effective ergonomic office chair.


OBJECTIVE: The objective of the study was to evaluate the differences between sitting on a stability ball and in an office chair in terms of trunk muscle activation and lumbar spine posture. BACKGROUND: Stability balls have become increasingly popular as an alternative to office chairs to help reduce the prevalence of low back pain; however, little research has been conducted on their use as office chairs. METHODS: The 14 participants (7 men, 7 women) were required to sit on both a stability ball and an office chair for 1 hour each while performing various computer workstation tasks throughout the sitting periods. The activation of eight muscles and lumbar spine posture were measured and analyzed. RESULTS: Increased muscle activation in thoracic erector spinae (p = .0352), decreased pelvic tilt (p = .0114), and increased perceived discomfort (p < .0001) while sitting on the stability ball were observed. CONCLUSIONS: The small changes in biological responses when sitting on a stability ball as compared with an office chair, combined with the increased reported discomfort while on the ball, suggests its use for prolonged sitting may not be advantageous. APPLICATION: Prolonged sitting on a stability ball does not greatly alter the manner in which an individual sits, yet it appears to increase the level of discomfort. Therefore, it is important to fully explore a new chair design and consult scientific research before implementing its use.

McGill SM, Kavcic NS, Harvey E. Sitting on a chair or an exercise ball: various perspectives to guide decision making. Clin Biomech (Bristol, Avon). 2006 May;21(4):353-60. Clinical Biomechanics, Department of Kinesiology, University of Waterloo, Ont., Canada. mcgill@uwaterloo.ca

BACKGROUND: Prolonged sitting is recognized as a risk factor for the reporting of low back troubles. Despite the use of exercise balls in replacement of the office chair, little quantitative evidence exists to support this practice and hence motivated this research. Given the potential for several biological effects and mechanisms this study was approached with several layers of instrumentation to quantify differences in muscle activation, spine posture, spine compression and stability while sitting on an exercise ball versus a stable seat surface. Also, differences in the pressure distribution at the seat-user interface were quantified for the different seat surfaces to provide an objective perspective on the mechanism influencing perceived comfort levels. METHODS: Eight male subjects volunteered to sit for 30 min on an exercise ball and on a wooden stool. Muscle activity and spine position were used to model spine load and stability. An additional seven sat on an exercise
ball and chair to examine pressure distribution over the contact area. FINDINGS: There was no difference in muscle activation profiles of each of the 14 muscles between sitting on the stool and ball. Calculated stability and compression values showed sitting on the ball made no difference in mean response values. The contact area of the seat-user interface was greatest on the exercise ball. INTERPRETATION: The results of this study suggest that prolonged sitting on a dynamic, unstable seat surface does not significantly affect the magnitudes of muscle activation, spine posture, spine loads or overall spine stability. Sitting on a ball appears to spread out the contact area possibly resulting in uncomfortable soft tissue compression perhaps explaining the reported discomfort.