



Abstract

- Clinical studies reveals that vitamin D deficiency (VDD) is associated with increase cerebrovascular risk
- Whether VDD will worsen intracerebral haemorrhage (ICH) recovery remains unknown
- In this study, ICH is induced in VDD and normal mice, and their recovery is measured
- It is found that VDD mice has worse recovery then normal mice

Method

- To induce ICH in mice, collagenase was injected into the striatum
- To induce VDD in mice, mice were fed with VDD diet
- To measure the recovery in mice, rotarod test and modified neurological severity scores (mNSS) were conducted and measured respectively

Results

- Compared to normal mice, VDD mice had a higher mortality on day 1 (VDD: mortality = 21.2%, n = 33; normal: mortality = 14.8%, n = 27)
- Compared to normal mice, VDD mice performed significantly worse on day 14 rotarod test. VDD mice also had significantly higher mNSS score on day 7 and 14, indicating worse condition.
- Compared to normal mice, VDD mice had significantly larger haematoma size on day 7. On day 1, normal mice and VDD mice haematoma size differed insignificantly

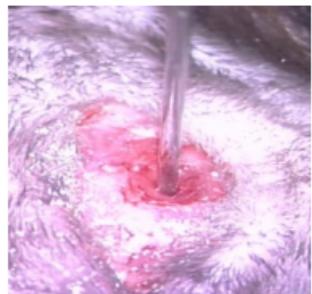


Figure 1: To induce ICH, collagenase is injected into the striatum of the mouse.

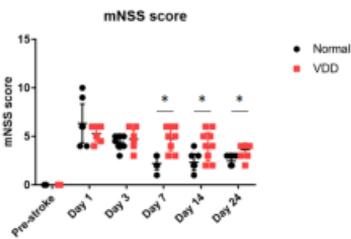


Figure 2a

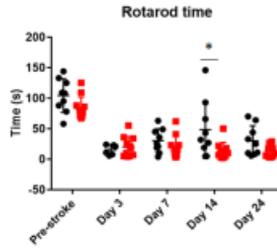


Figure 2b

Figure 2a: mNSS score of VDD and normal mice after stroke is measured. Higher mNSS score indicates more severe stroke condition and worse motor function. Figure 2b: Mice are placed on rotarod, and the duration they can stay on the rotarod are recorded. Shorter duration indicates worse motor function hence worse recovery.

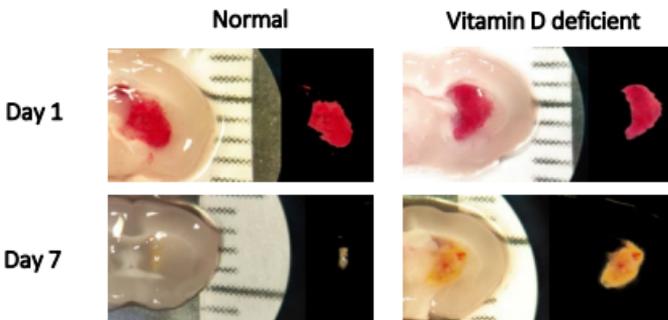


Figure 3a: Haematoma size in mice is evaluated by sectioning

Conclusion

- In VDD mice, A significant larger haematoma on day 7 but not day 1 may indicates delayed haematoma resolution
- Vitamin D is a known immunomodulator that enhance macrophage phagocytosis
- Macrophage is important in haematoma resolution by phagocytosing the red blood cells
- VDD mice may have compromised macrophages, thus delaying haematoma resolution
- Delayed haematoma resolution may cause worse behaviour outcomes during recovery

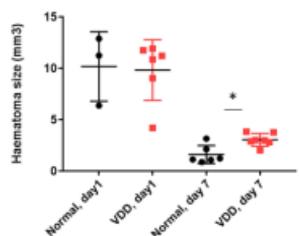


Figure 3b: haematoma size measured in difference days.