

Effectiveness of Vincristine on DFTD

DFTD (Tasmanian Devil Facial Tumor Disease) is an aggressive, transmittable facial cancer carried by an estimated 59% of the Tasmanian Devil population, with most animals infected living only 3-6 months after infection (Phalen DN, Frimberger A, Pyecroft S, et al., 2013). Vincristine is a cancer treatment commonly used in humans and other mammals. Vincristine works by interfering with the cell mitosis of the cancer, causing death during mitosis. In some studies Vincristine has been showed to have up to 100% effectiveness in removing or decreasing cancer (Phalen DN, Frimberger A, Pyecroft S, et al., 2013). In this experiment 8 Tasmanian Devils were given differing amounts of Vincristine (0.05 Mg/Kg - 0.136 Mg/Kg) in 9 non-uniform intervals over the course of 21 weeks. On top of measuring the effectiveness of Vincristine on the tumors. It was also only the second ever study testing the effect of vincristine on a marsupial, so they also recorded the side effects and their severities. The side effects were neutropenia, anemia, anorexia, vomiting, and diarrhea, and they were given grades from 1 (fewest and least severe) to 5 (Death).

The results of this study were quite disappointing, at least for the main objective of the study. There was no noted decrease in cancer activity in any animal, and at the end of the study, all animals were euthanized as a result of DFTD. On top of this, 3 of the 5 animals treated with 0.105 Mg/Kg were showing neutropenia grades 2-5 while the animals treated with lower amounts showed lower levels of neutropenia; however, this outcome still showed that the Tasmanian Devils and possibly other marsupials have a large toxic resistance to Vincristine and possibly other related cancer drugs.

Vincristine was used for the study because of its major effectiveness and safety during other experiments done with cats and dogs. Had it been effective in the treatment of DFTD, it would have been instrumental in helping to save the species. While the study was not successful in proving the effectiveness of Vincristine, it did find that Tasmanian Devils are able to withstand much higher levels of medicine than what is known to be toxic in mammals, as they used 4 times what is known to be effective in dogs, 3 times a normal dose in cats, and twice the normal dose used in humans of similar size (>10Kg). This discovery may still be very helpful in the healing of this cancer as it may mean that these Devils may be able to withstand high levels of other medicines that have not yet been tried.

All in all, the study showed that while vincristine had no effect on this cancer, due to the Tasmanian devil's resistance to its toxic effects, it may still be a viable treatment for other kinds of cancer in any kind of marsupial.

Works Cited

Phalen DN, Frimberger A, Pyecroft S, et al. Vincristine chemotherapy trials and pharmacokinetics in tasmanian devils with tasmanian devil facial tumor disease. Plos one. 2013