



A Review on Skin Cancer in Fishes

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Introduction

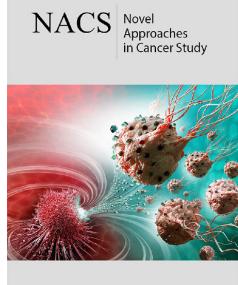
Cancer is the name given to a set of diseases. Cancer begins when the genetic information of a cell is destroyed, causing the cell to divide uncontrollably. The result of this abnormal division often appears as a lump or bulge, commonly known as a tumor. The tumor can be benign or malignant. The benign tumor does not multiply outside its original site and does not enter other organs, but the malignant tumor, which is made up of cancer cells, first multiplies in the same place and if treatment is not started at this stage, they can migrate to other organs, multiply and eventually become invasive cancer. The occurrence of malignancies is not a peculiarity of human tissues and is not even restricted to mammals. Possibly can affect the various animal groups. Assuming that the presence of a tumor in a tissue result of cell cycle control is lost, we can imagine that these accidents can happen in any living being that has tissue [1]. Neoplasms are common in fish and are classified similar to higher animals.

Skin cancer is a cancer that arises from the skin. These cancers are caused by abnormal growth of cells that can attack or spread to other parts of the body. There are three major types: Basal Cell Carcinoma (BCC), Squamous Cell Carcinoma (SCC), and melanoma. Chromatophores or pigment cell tumors are common tumors in fish, and outbreaks have been reported in both marine and freshwater fish throughout the world [2,3]. Melanoma is the most commonly reported pigment cell tumor in fishes living under natural condition [4]. Malignant melanoma remains one of the few cancers that is increasing in prevalence as well as mortality rate [5]. Most agree that UV exposure is the primary modifiable cause of melanoma; however, surprisingly melanomas frequently occur on non-sun exposed skin and indoor workers have a high incidence rate [6]. Therefore, the current ideology is that repeated UV exposure is the primary risk factor for malignancies on sun-exposed skin whereas genetic factors and predispositions are key factors in the etiology of the disease on non-sun exposed skin with isolated events of UV exposure perhaps contributing to the potential for neoplasms. Melanoma is the most dangerous type of skin cancer that can occur on any part of the skin. This type of cancer develops as a result of uncontrolled proliferation of melanocytes (skin pigment cells) and as a result is usually seen in black or brown, although it may have other colors such as red or white. Melanoma can metastasize rapidly in the body and affect almost any part of the body. Melanoma can be fatal if it progresses too much but is usually successfully treated if it is diagnosed early. Melanoma is less common than other types of skin cancers, such as basal cell carcinoma and squamous cell carcinoma, but it is more dangerous because it can metastasize to other parts of the body if left undiagnosed and untreated [7]. Unfortunately, in recent years, reports of melanoma in fish, especially in wild fish, have increased so much that there are various reasons such as excessive use of agricultural pesticides and its accumulation in rivers and seas [8-13] and increased UV radiation due to ozone depletion. That is why it is recommended to increase the research work in this field to find a suitable solution for the treatment of this cancer.

Treatment

Melanoma can be treated early with surgery and complete removal of the lesion. It is important to detect melanoma early before it thickens and progresses and metastasis to other tissues. The practical solution to control this complication varies depending on the environment. In hydrothermal fishponds, this is due to the oligotrophic of the pond, fertilization and increasing the water level is a good way to control it. Cold-water fishponds

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usually have a concrete structure. Increasing the water flow, increasing the water level of the pools and creating canopies along with paying attention to the geographical direction of the fish storage structures, which should be in the north-south direction, is helpful. It is better for aquaculture containers to be often dark and to use a matte coating for the roof of aquaculture structures. In addition to the previous cause, contaminants, especially heavy metals such as mercury and silver, can also lead to melanoma and skin cancer. The results of past research have shown that aquatic pollution, in addition to reducing the chance of survival, can induce a variety of tissue complications in aquatic animals [14-19].

Finally, there is currently no specific treatment for melanoma in aquatic animals, and fish infected with it are usually left untreated. However, due to the susceptibility of these fish to a variety of fungal and infectious diseases due to reduced immune levels, they are usually isolated from the herd, destroyed or infected in an isolated environment using a saltwater bath. They control the secondary to some extent.

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