Abstract: Melanoma is the deadliest skin cancer and its incidence rate continues to increase in United States in the past decades. Solar UV radiation, fair skin color, red hair and family history are all risk factors for melanoma; whether sex hormones play roles in melanoma development has not been demonstrated. Using SEER17 registry data, age-specific melanoma incidence rates were calculated and compared between male and female cases. Age-specific melanoma and non-melanoma skin cancer incidence rates were also calculated from Nordic Cancer Registry dataset as a validation and control for our US population. At age 44 and younger, females accounted for more melanoma cases than males, with a peak difference at age 20-24; but after age 45, the trend was reversed: males accounted for more melanoma cases. The bimodal gender difference was not observed in non-melanoma skin cancer which was confirmed to be caused by solar UV radiation. Solar UV radiation may be a causative factor for melanoma at older age (>45 years), but sex hormones may play an important role in melanoma occurred at younger age. This study opens new areas for melanoma etiology and prevention studies regarding sex hormones.