EFFECT OF SUN, VITAMIN D AND SKIN CANCER

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ABSTRACTS

Indonesia, especially in South Sumatra, is a tropical country where people are exposed to sunlight all the time. The sunlight exposure is both chronic and intermittent, which can cause both beneficial and detrimental effects. One of the examples of the detrimental effects are the increased incidence of skin cancer. Meanwhile, the beneficial effect is the formation of vitamin D in the body that stimulates bone formation, increases body resistance, and prevents skin cancer. At this time, there is an increase in the incidence of skin cancer, and many Indonesian people are deficient in Vitamin D. Currently, the people need to get an explanation through health workers at the TkI Health Facilities and Rivai Abdulah Hospital. It is necessary to increase knowledge about sunlight, the benefits of Vitamin D for health, and its effects on the incidence of skin cancer in health workers.

Keywords: Sun, Vitamin D, Skin Cancer

INTRODUCTION

Indonesia is a tropical country consisting of islands surrounded by oceans. South Sumatra is a province that has many rivers and a large area of land where most people work as fishermen and farmers, localized near the equator. This affects the intensity of sun exposure (SM) to the earth. Indonesia is a tropical, maritime, and agrarian country where sunlight every day, some of the population works as farmers, fishermen, manual laborers. Continuous or intermittent exposure can have both harmful and beneficial effects. SM exposure is a major environmental risk factor for causing skin cancer if the exposure is prolonged or intermittent. Environmental, physical, and personal factors influence the risks/benefits of sun exposure. In fair-skinned people, short sun exposure several times per week, being careful not to burn, and avoiding intentional tanning of the skin. Indonesian people based on Fitzpatrick's skin type mainly consist of skin type 3.4, some type 2, especially Chinese descent, type V in Papuan skin.

In addition, sunlight has beneficial properties to produce vitamin D. If exposure to SM does not last long, it will reduce the effectiveness of vitamin D function. Several studies have shown that vitamin D has a protective effect against the risk of skin cancer.

Identification of problems:

1. Lack of knowledge of health workers in primary health care what is meant by sunlight, harmful and beneficial effects of sunlight
2. How is sunlight related to skin cancer?
3. Advantages and disadvantages of sunlight
4. What is Vitamin D3 and how does it relate to SM and skin cancer
5. The problems of the five sources of Vitamin D3 and how to overcome the deficiency of Vitamin D3
6. How to prevent overexposure to sunlight?
7. How to avoid a lack of vitamin D intake?

General-purpose:

Knowing the effect of empowering health workers of Tk I Health Care Facilities on the effect of sunlight on Vitamin D and prevention of skin cancer

Special purpose

1. Adding to the repertoire of knowledge about SM, Vitamin D, and skin cancer
2. Knowing the attitudes and knowledge of health workers towards SM, Vitamin D, and skin cancer
3. Knowing the effect of sunlight on skin cancer
4. Knowing the effect of vitamin D on skin cancer

Benefit

1. For Health Workers
   The existence of counseling about the effect of sunlight and vitamin D on skin cancer to health workers so that they can increase knowledge about SM, Vitamin D, and skin cancer.
2. For the Faculty of Medicine
   Adding scientific publications related to knowledge, attitudes, and knowledge of health workers on SM, Vitamin D, and skin cancer.

METHOD

This community service is in the form of health counseling/education. Community service in collaboration with Abdullah Rivai General Hospital, the government of Health Facilities in the Banyuasin district September 23, 2021, at 12 -14.00 WIB via online (zoom). Evaluation of activities was held by assessing and comparing pre-test before counseling and post-test after counseling, regarding the empowerment of the influence of sunlight and vitamin D on skin cancer.

RESULTS

From the results of online community service counseling to health workers at primary health facilities and RSU Rivai Abdullah, Banyuasin Regency Online outreach activities have been carried out in health services at primary health facilities and Dr. Rivai Abdullah Hospital Banyuasin district, the activity was carried out online via Zoom, the number of participants who took part in this counseling was 100 health workers. Participants who took the pre-test and post-test were 80 participants, the results of the pre-test and post-test showed that the Pre-test got a score of 60, while after the post-test got a score of 80, indicating that the health workers followed the counseling well, so that the post-test results The test shows an increase in knowledge about SM, Vitamin D, and skin cancer, although activities need to be carried out on an ongoing basis, for example, every 6 months.

DISCUSSION

Sunlight has both beneficial and detrimental effects on the human population. The beneficial effects of sunlight on body health include dehydrocholesterol precursors in suprabasal blood vessels and can form Vitamin D2,3 in the basement membrane or suprabasal blood vessels keratinocytes and dermal fibroblasts are converted to Vit D 2, 3, enter into the blood vessel circulation and bind to vitamins. D binding protein (DBP), vitamin D increases in serum within 24-48 hours. In addition, vitamin D3 is present in the body due to the influence of SM

exposure, also other sources of vitamin D3 can be found as supplements or derived from nature such as liver, cheese, egg yolks, as well as mackerel fish, tuna, salmon and beef liver. Vitamin D deficiency is influenced by inadequate diet, failure to absorb, use.

Exposure to sunlight to the human body consists of Ultraviolet B (295-315 nm), Ultraviolet A (315-340 nm), and other rays, namely UVC, visible light, and infrared light which are filtered by the ozone layer stratosphere. The ratio of UVA and UVB exposure to the earth depends on the zenith and latitude angles (latitude), weather, and time of day. The effect of UV exposure on the skin plays a role in the occurrence of malignancy

Skin cancer is a malignant tumor of the skin arising from keratinocyte cells known as keratinocyte carcinoma and melanocyte cells, known as cutaneous melanoma. Keratinocyte carcinoma or previously known as non-melanoma skin cancer (NMSC) is a skin cancer that is often found consisting of basal cell carcinoma (BCC) and squamous cell carcinoma (SCC); rare cutaneous malignant melanoma (Mc)[1] Recently in the world there has been an increase in the incidence of skin cancer, also in developing countries such as Indonesia, especially in Palembang. Generally found at an advanced stage that requires difficult and complex action, increases morbidity and mortality, thus requiring large costs and long hospitalization.

In developing countries, including Indonesia, especially Palembang, the increasing incidence of skin cancer is due to, among other things, the lack of knowledge of health practitioners including health workers in primary health facilities, resulting in no promotion or explanation to the local community about skin cancer and its problems.[4.5]

According to the theory, the role of risk factors for skin cancer is influenced by extrinsic factors and intrinsic factors. It is proven that extrinsic factors, especially the accumulation of prolonged or intermittent exposure to sunlight, are ultraviolet rays (UVA and UVB). As a major risk factor for skin cancer, Sunlight exposure is prolonged, intermittent, and very strong with a short period, or Sunlight exposure begins in childhood. Other extrinsic risk factors are evidenced by the use of pesticides, smoking, viruses, artificial light, while intrinsic factors include mutations/impairments in protein expression, genetic factors in the form of biological molecular mutations, including increases or mutations in p53, sonic hedgehog (SHH).[6-7]

Indonesia is an archipelagic country surrounded by seas, most of which are associated with prolonged and intermittent exposure to sunlight, such as fishermen, farmers, especially oil palm and coconut farmers, rubber tappers, who are not aware of the dangers it poses. Generally, skin cancer is more common in men than women in the range of 2:1, mainly found in the elderly 50 years, and the incidence increases with age. The location of skin cancer, especially BCC, is found in areas exposed to sunlight, including the face of the superior and inferior extremities, although rarely can also be found in areas with reduced skin pigment not exposed to sunlight such as the trunk, gluteus. The location of KSS is mainly found in scar tissue, especially in the lower limbs [4,7,8]

Sunlight has beneficial properties to produce vitamin D if exposure to sunlight does not last long because it will reduce the effectiveness of the function of vitamin D [9]. Several studies have shown that vitamin D has a protective effect against the risk of skin cancer.[10].

Skin pigment is one of the protectors against SM which is produced by Vitamin D adequately, reduced skin pigment will cause direct UVB exposure to be absorbed by the skin, especially the epidermis and dermis which causes thymidine dimerization and changes in DNA structure that increase the risk of developing or growing cancer. skin (KK) and cutaneous melanoma)[12]. The presence of chronic sunlight exposure results in DNA damage or defects causing an inflammatory reaction, excessive free radical formation.[5]

Keratinocyte carcinoma (KC) or non-melanoma skin cancer consists of BCC and SCC is a skin cancer that arises from keratinocyte cells, so it is known as keratinocyte carcinoma. In the United Kingdom, new KK is found every year in the range of 142.00 cases consisting of BCC in the range of 80% and SSC in the range of 20%. Almost the same as the Constitutional Court, in 10 years there has been an increase in the incidence of KC by 61%. Of the three skin cancers above BCC, it is a skin cancer with a good prognostic ratio compared to SCC and Mc, BCC very rarely has distant metastases, found only in the range of 0.05-0.28%, but can cause tissue destruction around the tumor, causing a negative cosmetic impact if action is not taken as early as possible. Generally, the clinical picture is a red or black lump or spot, shiny like pearl edges, easy to bleed,

Squamous cell carcinoma (SCC) is found in 20% of all KC, has a worse prognosis than BCC, can undergo distant metastases, and cause mortality. Generally, SCC is not only caused by the accumulation of sunlight exposure but also occurs in cicatricial tissue such as cicatricial tissue either due to burns or chronic infection. and chemicals such as pesticides due to old wounds that do not heal have mutations in genes either proto-oncogenes or suppressor genes.[11]

Cutaneous melanoma (Mc) is the fifth most common skin cancer of other cancers. This type of malignant skin tumor is the most malignant and can cause death. The diagnosis is made as early as possible so that treatment can be carried out as soon as possible. In the last decade, Mc has increased in the United Kingdom, around 16,000 cases of Mc were found in 2016. If the Mc diagnosis is made at an early stage, the 5-year survival is more than 95%. Because it needs early detection and treatment quickly. Mc is the most malignant skin cancer compared to KC because it is easy to metastasize, more than 90% of deaths occur. Currently, Mc is often found in the age range of 30 years, and it is suspected that among other skin cancers there will be an increase in the incidence in the next 20 years in the range of 7%.[7]

Experimental research proves there is a relationship between vitamin D and the risk of skin cancer. In studies on cancer cells and tumors in mice, it has been shown that vitamin D in a state of several activities can reduce growth retardation / prevent cancer growth or cancer development through promoting cellular differentiation, reducing cancer cell growth, cell death (apoptosis), and reducing the formation of cancer cells. blood vessels (angiogenesis)

Epidemiological study for 3 years (2017-2019) in Palembang found n=346 cases of skin cancer consisting of KC, namely BCC as 162 cases (46.8%) and SSC as 130 cases (37, 6%); and Mc as 32 cases (9.2%); and other skin cancers in 13 cases (3.8%). There are more women than men 1.14: 1. The most consecutive age, 55-64 years are 115 cases (33.2%) and

age >65 years are 90 cases (26%), the mean age is 56 years, with the highest distribution based on occupations, occupations related to sunlight exposure, farmers/fishermen as 169 cases (48.8%) the most locations were facial as 224 cases (64.7%) especially periorbital. This study shows that there has been a five times increase in skin cancer compared to the 2016 study[2]

Vitamin D is a group prohormone/fat-soluble substance. which always has a little hormonal activity, only the body needs this hormone). Vitamin D will help the body use calcium and phosphorus which form bones and teeth. Skin exposed to sunlight will make Vit D, and Vit D can also be obtained from certain foods. Deficiency Vitamin D levels are often found in Rickets disease in children and Osteomalacia in adults

There are two forms of vitamin D, the important one is vitamin D2 in humans/and vitamin D3 or ergocalciferol and is made naturally through exposure to SM. Vitamin D¬2 occurs naturally from plants while vitamin D3 is naturally obtained through exposure to SM. Both forms of this vitamin are converted to 25-hydroxy vitamin D in the liver. 25-hydroxy vitamin D travels from the blood vessels to the kidneys, then undergoes changes/modifications to 1,25-hydroxy or calcitriol, calcitriol is the active form of Vit D in the body. For the most part, with accurate evaluation methods in vitamin D people, the level of 25-hydroxyvitamin D in the blood is assessed

Some people need vitamin D that comes from direct exposure to sunlight, as well as sources from the diet including some foods that are naturally obtained from foods that contain vitamin D such as fish oil, liver oil, and eggs. However, some dietary vitamin D comes from foods rich in vitamin D, such as milk, juices, and cereals for breakfast, which can also be obtained from dietary supplements.

According to the National Academies from the Institute of Medicine (IOM), there are recommendations for vitamin D / day

1. Minimal from Sunshine

2.. At the age of 1-70 years, including pregnant or breastfeeding women, it is recommended to give 15 micrograms of vitamin D per day. Because 1 microgram is equivalent to 40 international units (IU), it is recommended that dietary vitamin D be given the Recommendation dietary allowance (RDA) of 600 IU/day.

3. At age 71 years, RDA 20 micrograms/day (800 IU/day)

4. For infants, the IOM has not been able to recommend, due to lack of research data, but the administration of VIT D according to the IOM is 10 u7g/day, IOM recommends a dose for infants at a level of 10 ug/day (400 IU)

Prevention of skin cancer is focused on educating health workers and cadres about the risks and benefits of sunlight effects and providing detailed advice and explanations on how to avoid strong and prolonged exposure to sunlight[2,3].

Generally, skin cancer patients who are referred to tertiary hospitals are in an advanced stage with complications, increasing morbidity and mortality, causing difficulties in carrying out treatment so that the cost of action and treatment in hospitals is high and becomes a burden on the state.

CONCLUSION

Based on the results of previous studies, as well as discussions, problems for health workers at the primary Health Facilities and Rivai Abdullah general hospital, knowledge about the influence of sunlight, skin cancer, Vitamin D is still low and knowledge is only obtained during the education period, so that health workers and cadres are not clear, what is the meaning of SM and Vit D to prevent skin cancer, and how the Effect of sunlight, Vit D and the characteristics of skin cancer, causes of skin cancer, and how to prevent it

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