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## comparative study of the prevalence of thyroid disorders

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### ABSTRACT

*Thyroid hormone disorders are the commonest endocrine disorder in India and also the commonest preventable cause of mental retardation. The male and female ratio of the disease ranges from 4:1 to 7:1. Untreated hypothyroidism during pregnancy can lead to delays in growth and intellectual development in the baby. The present study focused on the comparison of prevalence of thyroid disorders on various aspects like Comparison of prevalence of thyroid disorder on the basis of age, on the basis of gender and on the basis of religion. The clinic-based study was conducted in the clinic Ranchi, in this study 305 patients are taken as sample who visited in the clinic for treatment of thyroid disorder (Hypothyroidism, Hyperthyroidism) from year sept 2015 to dec 2017. Patients of all age are included in the study. Out of the 305 patients with thyroid disorder 298 patients found to have hypothyroidism (98%) and 7 patients with hyperthyroidism (2%). On the comparison of disorders found that hypothyroidism is more prevalent than hyperthyroidism. Thyroid disorder is more prevalent in female than male. There is a high prevalence of thyroid dysfunction in female in Ranchi and need for similar studies from different regions of the country covering larger population are well appreciated.*

**Keywords:** Prevalence, Hypothyroidism, Hyperthyroidism, Comparison, Gender

### 1. INTRODUCTION

Thyroid diseases are common worldwide. In India too, there is a significant burden of thyroid diseases. According to a projection from various studies on thyroid disease, it has been estimated that about 42 million people in India suffer from thyroid diseases. According to statistics, thyroid disorders are on the rise in India. Approximately 1 in 10 Indian adults suffer from hypothyroidism, A 2016 study conducted in nine Indian states, assessing prevalence of hypothyroidism in pregnancy with TSH found 13.13 per cent of pregnant women to be hypothyroid.

This review will focus on the prevalence of two common thyroid diseases in Ranchi: (1) hypothyroidism, (2) hyperthyroidism.

The thyroid gland is a 2-inch butterfly-shaped organ located at the front of the neck. Though the thyroid is small, it's a major gland in the endocrine system and affects nearly every organ in the body. It is usually compared to the shape of a butterfly. The wings are called lobes, and each lobe sits on the side of your windpipe or trachea. The middle of the butterfly (called the isthmus) connects the two lobes. Endocrine glands make hormones that are secreted into the bloodstream. Hormones are chemicals made in one part of the body that send messages to other parts of the body, regulating growth, metabolism, and mood. This is different from an exocrine gland, which secretes needed substances through a duct system — not through the bloodstream. It regulates fat and carbohydrate metabolism, respiration, body temperature, brain development, cholesterol levels, the heart and nervous system, blood calcium levels, menstrual cycles, skin integrity, and more.

Thyroid is responsible for making the hormones monoiodotyrosine (T1), diiodotyrosine (T2), triiodothyronine (T3), and thyroxine (T4). These hormones are made from tyrosine, which is a protein and the mineral iodine. T1 has one atom of iodine attached to the molecule, T2 has two atoms of iodine attached, T3 has three atoms of iodine attached, and T4 has four atoms of iodine attached. Thyroid needs iodine to make these hormones. Iodine must be supplied by our diet, since there is no other way to acquire it.

Thyroid disease in history is extremely interesting. Back in the mid-seventeenth-century, enlarged thyroids (goiters) were thought to be beautiful and a fashionable thing to have. In historical literature, surgery was done on them only when a patient had trouble breathing. Many people died from surgery at this time to remove the thyroid, and those that lived had problems with severe hypothyroidism. It was only 300 to 400 years ago that the thyroid was named by Thomas Wharton, and society today is fortunate indeed to have a better understanding of the thyroid and its functions. There are specific kinds of thyroid disorders that includes Hypothyroidism, Hyperthyroidism, Goitre, Thyroid nodules and thyroid cancer. These disorders are more common in female than male.

Hypothyroidism is an inadequate output of thyroid hormone may develop at any stage of life even in utero. The inadequate production of thyroid hormone may be due to either disorders of the thyroid gland itself or to anterior pituitary insufficiency. The prevalence of hypothyroidism in adult population is associated with severe iodine deficiency. The individuals with slight abnormalities of thyroid hormone genesis are more sensitive in which the iodine deficiency unmasks the defect. Thyroid hormonogenesis interfered by substances may aggravate the effect of iodine deficiency. Also explained that iodide excess from several sources cause hypothyroidism in individuals who fail to escape from Wolf -Chaikoff effect.

Hypothyroidism is common condition and is more prevalent in women, elderly and ethnic group's .the prevalence of the disease increases with the age and reaches 4.5% in the elderly population. The male and female ratio of the disease ranges from 4:1 to 7:1.Untreated hypothyroidism during pregnancy can lead to delays in growth and intellectual development in the baby.

Hyperthyroidism, or overactive thyroid, happens when thyroid gland makes more thyroid hormones than our body needs.

Hyperthyroidism may be of several types. Graves' disease is the most common cause and toxic nodular goitre is not uncommon, but on rare occasion, Hyperthyroidism may be due to a variety of other causes.

Goitre due to iodine deficiency often be associated with other factors such as increased need for thyroid hormone and/or enzymatic defects. All work together to produce goitre.

At times of rapid growth or change like puberty, pregnancy, menopause and during periods of infection demand for thyroid hormone, increases and the need for iodine rises. So, the prevalence of thyroid disorders are vary in male and female, and increases with age and in areas of iodine deficiency. However, the prevalence and pattern of thyroid disorders depend on ethnic geographic and environmental factor's including iodine intake status. The present study focuses on the comparison of prevalence of thyroid disorders on various aspects.

**2. OBJECTIVE**

- Comparison of prevalence of thyroid disorder on the basis of age.
- Comparison of prevalence of thyroid disorder on the basis of gender.
- Comparison of prevalence of thyroid disorder on the basis of religion.

**3. METHODS AND MATERIAL**

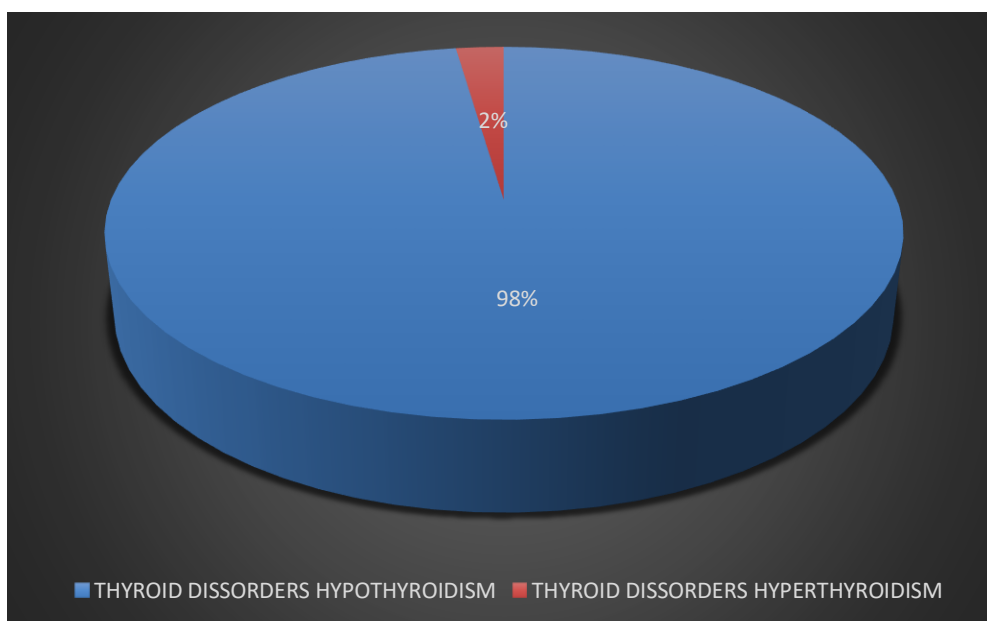
This was the clinic based study conducted in the “Diakare Diabetes specialities clinic Ranchi, in this study 305 patients are taken as sample who visited in the clinic for treatment of thyroid disorder(Hypothyroidism, Hyperthyroidism) from year sept 2015 to dec 2017. Patients of all age are included in the study.

**4. RESULTS AND FINDINGS**

Out of the 305 patients with thyroid disorder 298 patients found to have hypothyroidism (98%) and 7 patients with hyperthyroidism(2%). On the comparison of disorders found that hypothyroidism is more prevalent than hyperthyroidism. (figure 1)

**Table 1: Comparison of prevalence of thyroid disorder.**

| Thyroid Disorders |                 |
|-------------------|-----------------|
| Hypothyroidism    | Hyperthyroidism |
| 98%               | 2%              |



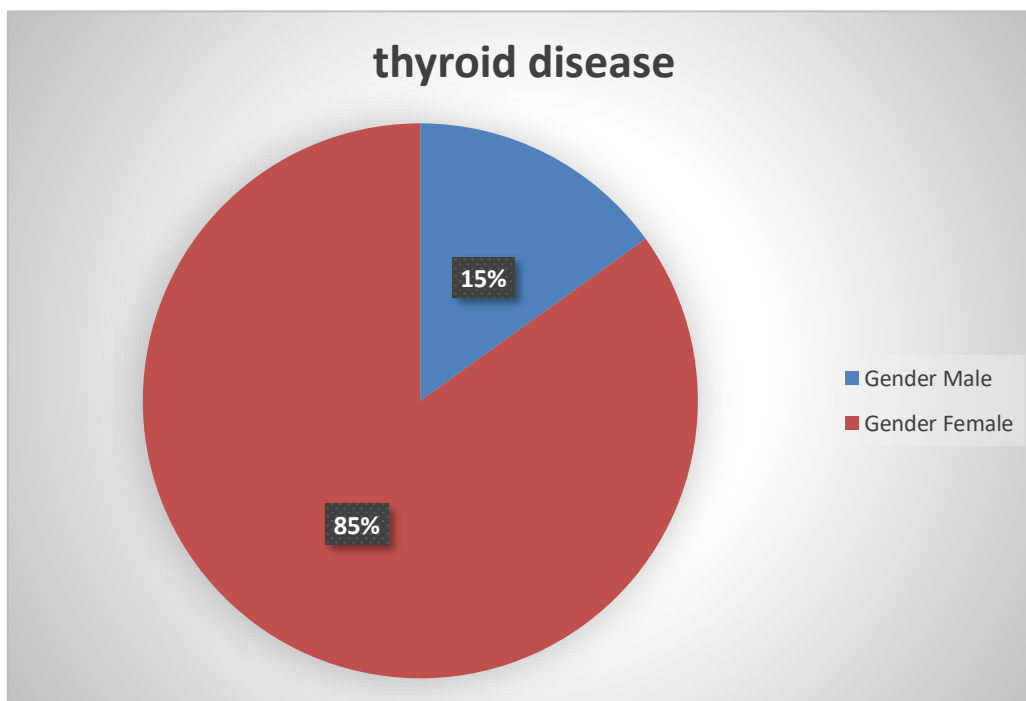
**Fig. 1: Comparison of prevalence of thyroid disorder**

In Comparison of prevalence of thyroid disorder on the basis of gender, out of 305 patients 46 male patients (15%) have found with thyroid disorder and 259 female (85%) have found thyroid disorder. Thyroid disorder is more prevalent in female than male. (figure 2)

Out of 46 male patients, 2 patients (4.35%) have hyperthyroidism and 44 patients (95.65%) have hypothyroidism and out of 259 female patients 7 patients (1.9%) have hyperthyroidism,254 patients (98%) have hypothyroidism. (figure2.1)

**Table 2: Comparison of prevalence of thyroid disorder on the basis of gender.**

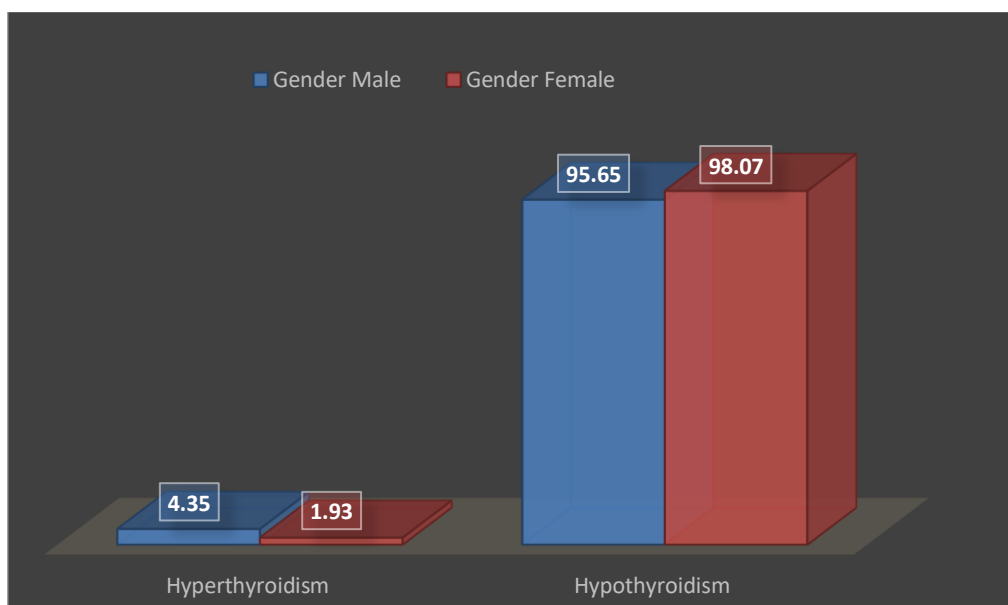
|                        | Gender          |                 |
|------------------------|-----------------|-----------------|
|                        | Male(%)         | Female(%)       |
| <b>Thyroid disease</b> | <b>15.08197</b> | <b>84.91803</b> |



**Fig. 2: Comparison of prevalence of thyroid disorder on the basis of gender.**

**Table 2.1: Comparison of prevalence of thyroid disorder on the basis of gender.**

| Thyroid Disorders      | Gender       |              |
|------------------------|--------------|--------------|
|                        | Male(%)      | Female(%)    |
| <b>Hyperthyroidism</b> | <b>4.35</b>  | <b>1.93</b>  |
| <b>Hypothyroidism</b>  | <b>95.65</b> | <b>98.07</b> |
| <b>Total</b>           | <b>100</b>   | <b>100</b>   |

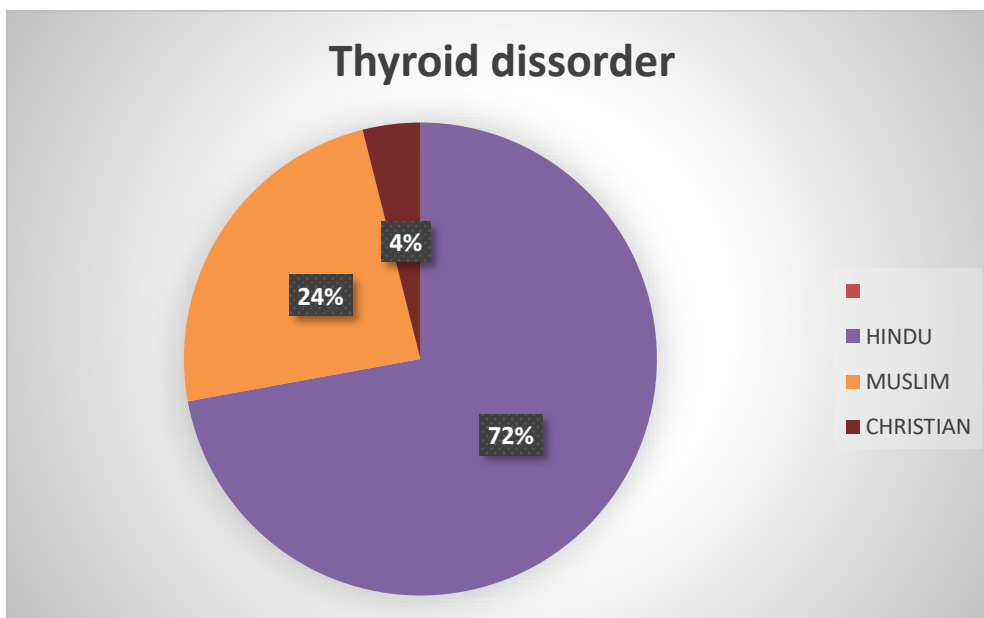


**Fig. 2.1: Comparison of prevalence of thyroid disorder(hypothyroidism, hyperthyroidism on the basis of gender.**

In the comparison of prevalence of thyroid disorder on the basis of religion, 72% patients were hindu, 23.9% were Muslim and 3.9% were Christian. Hindu patients are highest in number with thyroid disorder, and Christian patients were lowest in number who visited the clinic for treatment. (figure 3)

**Table 3: Comparison of prevalence of thyroid disorder on the basis of religion.**

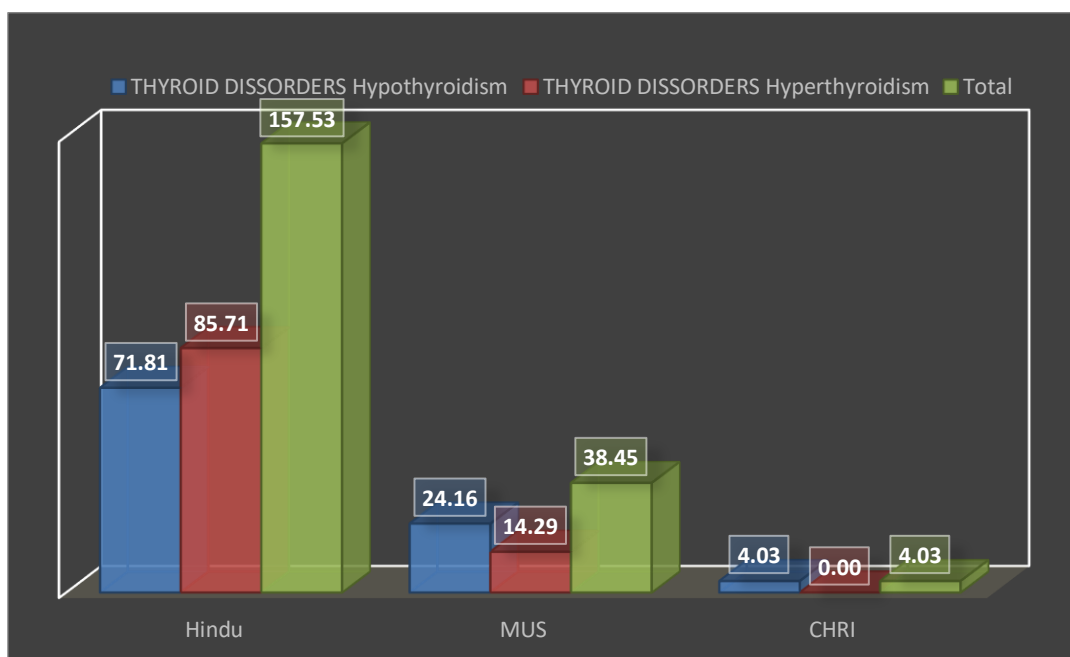
| Religion  | Thyroid disorder(% AGE) |
|-----------|-------------------------|
| Hindu     | 72.13114754             |
| Muslim    | 23.93442623             |
| Christian | 3.93442623              |



**Fig. 3: Comparison of prevalence of thyroid disorder on the basis of religion.**

**Table 3.1: Comparison of prevalence of thyroid disorder(hypothyroidism, hyperthyroidism on the basis of gender.**

| Religion  | Thyroid Disorders |                    |
|-----------|-------------------|--------------------|
|           | Hypothyroidism(%) | Hyperthyroidism(%) |
| Hindu     | 71.81             | 85.71              |
| MUSLIM    | 24.16             | 14.29              |
| CHRISTIAN | 4.03              | 0.00               |
| Total     | 100               | 100                |

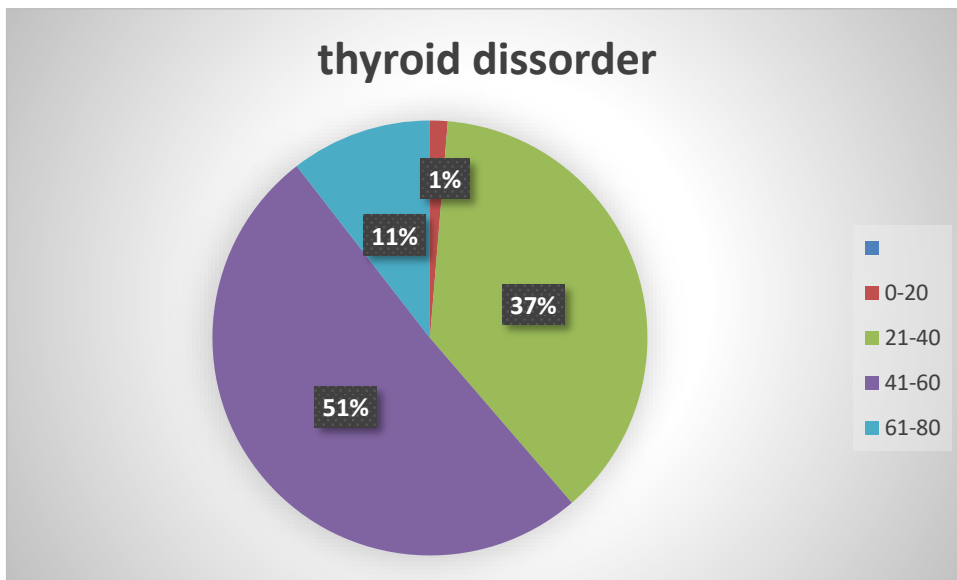


**Fig. 3.1: Comparison of prevalence of thyroid disorder(hypothyroidism, hyperthyroidism on the basis of religion**

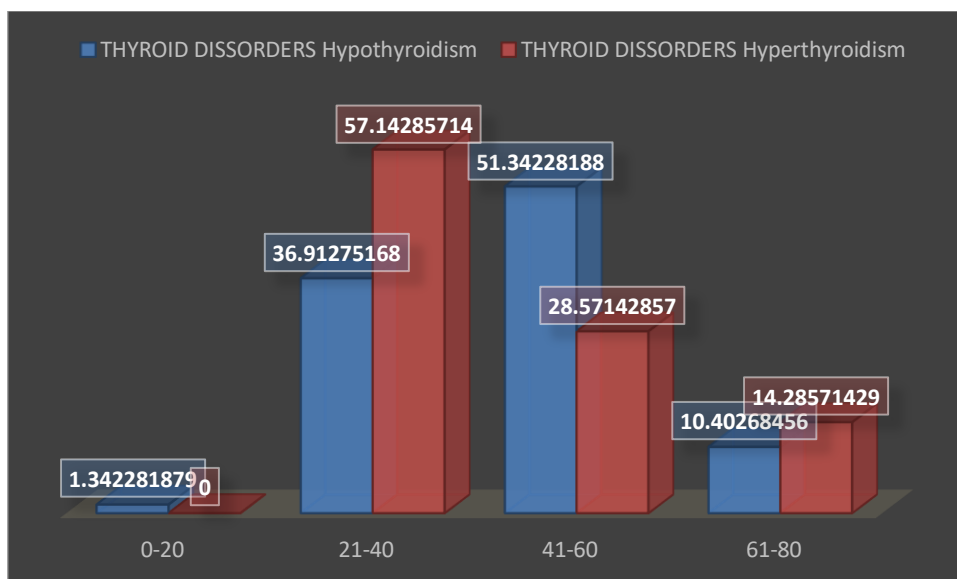
In Comparison of prevalence of thyroid disorder on the basis of age. Thyroid disorder found in age group of 0 -20 (1%), 21-40(37%), 41-60(51%) and in 61-80(11%) . The prevalence of Thyroid disorder is highest in 41-60 age group and lowest in 0-20 age group. (figure 4)

**Table 4: Comparison of prevalence of thyroid disorder on the basis of age.**

| Age   | Thyroid Disorders |                 |
|-------|-------------------|-----------------|
|       | Hypothyroidism    | Hyperthyroidism |
| 0-20  | 1.342282          | 0               |
| 21-40 | 36.91275          | 57.14286        |
| 41-60 | 51.34228          | 28.57143        |
| 61-80 | 10.40268          | 14.28571        |



**Fig. 4: Comparison of prevalence of thyroid disorder on the basis of age.**



**Fig. 4.1: Comparison of prevalence of hypothyroidism and hyperthyroidism on the basis of age.**

**5. CONCLUSION**

The prevalence of thyroid disorder specially hypothyroidism is more in female patients and age group of 41-60, which affects the health and productivity in many ways. In Ranchi many cases are remain unrecognized and may cause decrease in productivity. The findings of this study underscore the need of awareness about the disease and its adverse effects on health.

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