

# Horsegram Induced Gynecomastia



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## Abstract

Gynecomastia is benign enlargement of male breast. It is caused by high estrogen to androgen ratio, attributable to various causes of estrogen excess or androgen deficiency. Herewith we report a case of gynecomastia in a middle aged man due to excess consumption of horse-gram, containing flavonoids which are estrogenic compounds. Gynecomastia regressed gradually after stopping horse-gram consumption, without any other medical or surgical interventions.

**Keywords:** Gynecomastia; Horse-gram; Flavonoids

## Introduction

Gynecomastia develops due to high estrogen or low androgen levels/activity [1]. Exposure to exogenous estrogens is one of the causes, which includes excess consumption of phytoestrogens [2]. Isoflavones and flavonoids are phytoestrogens that can cause gynecomastia when ingested in high quantities. Case reports of gynecomastia due to Soy isoflavones [3]; lavender and tea tree oils [4] have been reported. Here we report a case of horse gram flavonoid induced gynecomastia.

## Case Report



**Figure 1:** Bilateral gynecomastia (Left > right).

A 41 years old gentleman presented to Endocrinology outpatient services with complaints of pain and enlargement of both breasts for the past 2 months. There was no history suggestive of primary or secondary hypogonadism, relevant systemic illnesses or consumption of medications/supplements. There wasn't any history of regression of secondary sexual characters or reduced sexual desire or function. He was consuming about 100g of boiled horse gram per day for the past 4 months, for weight loss and

diabetes prevention, which he started on his own after obtaining the information from internet. He temporally related onset of gynecomastia to horse gram intake with onset of gynecomastia after 4 weeks of starting horse gram consumption. Patient was obese (BMI: 28.2kg/m<sup>2</sup>) and breast examination revealed tender, asymmetric bilateral gynecomastia (larger on left side), with no discharge on expression (Figure 1). External genitalia and sexual maturity rating (SMR: P5, stretched penile length: 12cm, testes volume: 20cc bilateral) were appropriate for age. Hormonal evaluation was normal except for mild elevation of serum estradiol (Table 1).

**Table 1:** Hormonal evaluation for gynecomastia.

Investigation	Observed Value
Serum Free thyroxine	0.94ng/dl
Serum thyroid stimulating hormone	1.16μIU/ml
Serum estradiol	78pg/ml
Serum follicle stimulating hormone	7.16mIU/ml
Testosterone	5.16ng/ml
Beta human chorionic gonadotropin	0.22mIU/ml
Dehydroepiandrosterone	117.9μg/dl

Ultrasound of breasts revealed glandular tissue of 4.8cm x 3.2cm and 1.2cm x 1.8cm in left and right breasts respectively, and was of diffuse glandular type of gynecomastia. No radiological evidence of breast tumour was found. As there wasn't any other etiological history except for horse gram intake, we advised him to stop its consumption; suggested lifestyle modification for weight loss and diabetes prevention. On follow up there was reduction in glandular tissue size which gradually regressed over 6 months, without any additional specific medical or surgical interventions.

## Discussion

Gynecomastia is benign enlargement of male breast caused by proliferation of glandular tissue [5,6]. It can be defined as the presence of >2cm of palpable, firm, subareolar gland and ductal breast tissue [7]. Prevalence is about 30-70% in adult men [8]. Estrogens stimulate breast tissue proliferation, whereas androgens inhibit this process [1]. It is believed that most cases of gynecomastia are caused by an imbalance of these two influences, where estrogen-induced stimulation dominates [9,10].

Causes of estrogen excess can be exogenous or endogenous. Exogenous causes include exposure in form of estrogen containing nutritional supplements or medications, skin contact with estrogen containing cream or cosmetics, occupational exposure or excessive consumption of phytoestrogens [11]. Phytoestrogens are substances of plant origin that are structurally and functionally analogous to the estrogen, 17 $\beta$ -estradiol (E2) [12-14]. They include various groups of compounds like isoflavonoids, lignans, flavonoids and polyphenols, which in turn have multiple subgroups [15]. Isoflavones and lignans are abundant in soy products and flax respectively, [16] with soy containing more than about 100 phytoestrogens [15].

Horse-gram (*Macrotyloma uniflorum*) is a minor legume used as a pulse crop in India with good nutritional quality. Horse-gram contains many phytoestrogens of flavonols group (flavonoids) such as quercetin, kaempferol, myricetin, daidzein, and genistein [17]. Seed concentrations of myricetin, quercetin, and kaempferol ranged from 0-36 $\mu$ g/g dry weight (DW), 0-27 $\mu$ g/g DW, and 240-316 $\mu$ g/g DW, respectively [18].

Case reports of gynecomastia due to phytoestrogens have been described for soy compounds [3]; lavender and tea tree oils [4]. To the best of our knowledge, we report the first case of horse gram induced gynecomastia. Management of gynecomastia is directed at correction of underlying cause. Discontinuation of the offending compound causes resolution of gynecomastia, as observed in our case, thus potentially avoiding any medical or surgical therapies and associated social and financial burden over patients.

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