

**Mini-review****Potential Therapeutic Effect of Barley on Cardiovascular Diseases**

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**ABSTRACT**

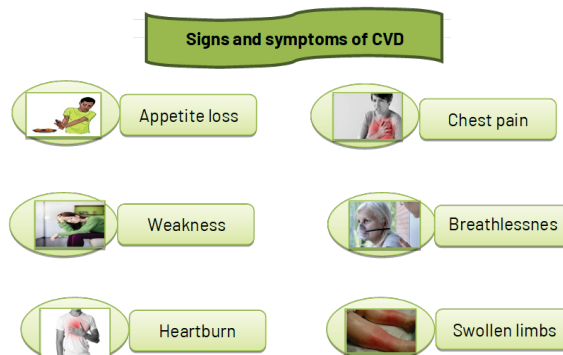
Barley is a fantastic food option for those with various illnesses as well as for those who want to lead a healthy lifestyle. This cereal is a great source of soluble dietary fiber, particularly beta glucans, and it also includes vital vitamins and minerals. For its excellent antioxidant activity and as a source of vitamins and minerals, green barley is advised. Depending on phytonutrients such as -glucan, phenolics, flavonoid, lignans, tocols, sitosterol, and folic, regular consumption of whole wheat grain and its hydroethanolic extracts decreases the risk of chronic ailments (hyperglycemia, malignancy, overweight, cardiac disease. Barley and its products in a recent year had gain an importance due to its counteractive components which play potent role against cardiovascular diseases by lowering down the oxidative stress and improving High density lipoprotein further Lowering down low-density lipoprotein, VLDL ratios further regulating insulin levels and lowering down the spike in blood glucose levels showing potent anti-oxidative and cardiovascular functions. Due to their abundance in these nutrients, barley is effective in promoting healthy bodily function. To enjoy all of the advantages of barley, barley grain is a wonderful option.

**INTRODUCTION**

Elevated blood pressure, coronary heart disease (CHD), heart failure, and stroke are all examples of cardiovascular disease (CVD), a condition that affects the heart and blood arteries. Elevated blood pressure, coronary heart disease (CHD), heart failure, and stroke are all examples of cardiovascular disease (CVD), a condition that affects the heart and blood arteries. This disease is usually related with fatty deposits which are buildup inside arteries and there is chance of blood clots. Strokes and heart attacks are acute events which are mainly caused by obstruction of blood from going from the heart to brain. Heart muscles, valves are affected by the heart disease this can also result in arrhythmias. Heart and blood vessel disorders that

impact the anatomy and physiology of the circulatory system are referred to as cardiovascular diseases [1]. Hypertension, ischemic heart disease, Peripheral vascular disease, stroke, rheumatic heart disease, heart failure, valvular heart disease, and a congenital cardiac condition are the most prevalent forms of CVD [2]. Cardiovascular diseases (CVDs) are becoming more common over the world and are currently regarded as the main cause of death in both emerging and industrialized nations. The prevalence of these diseases has increased and reached alarming levels in recent decades as a result of the quick economic development and increasingly westernized lifestyle [3]. Symptoms include chest pain, breathlessness,

feeling dizzy, faint, swollen limbs, fatigue, weakness, very fast or slow heartbeat, numbness in legs or arms, stress, and being physically inactive [4] as shown in Figure 1.



**Figure 1:** Signs and Symptoms of CVD

**Health benefits**

*Hordeum vulgare*, often known as barley, is a plant in the Poaceae family. One of the oldest cereal crops still being cultivated today is barley [5]. It is estimated that barley was cultivated from its native relative roughly 10,000 years ago. Phenolic acid, folate, vitamin E, lignans, phenolic acids, flavonoids, phytosterols are all present in whole grain barley. Barley is not just a significant feeder, malts, and food crops in several countries throughout the world, as well as the greatest cereal resource of functional component among the most widespread variety of multifunctional cereal crops and are incredibly full of beneficial nutrients. Especially fibre, phenol's, flavones, phytosterol, alkylneresorcinols, benzoxenezinoids, lignans, tocols, and folic acid, which have anti-diabetes, anti-cancer, anti-obesity, preventive cardiovascular disease, antioxidant, anti-proliferative, and cholesterol lowering properties [6,7].

**Functioning Ingredients in Barley grass and Barley grain against chronic illnesses:**

β-Glucans can be used as candidates for the medication in the treatment of human chronic diseases as depicted in Table 1:

| Preventative action against Chronic Illnesses | Functioning component in Grass   | Functioning components in Grains   | References |
|---|--|--|------------|
| Anti-Hyperglycemic effect                     | Saponin; Fibres Calcium; AMPK, polyaminases; Gamma alpha amino butyric acid, Sodium Oxide Dismutase.                                 | beta-glucan; phenols polysaccharidases; tocolic compounds; phytosterolic compounds, resistant starches.                            | [8]        |
| Lipid lowering effects or anti-obesity        | Saponin; α-tocopherols; 2"-O- homovitexin, polysaccharidases   | Polysacchridases, starches, tocolic compounds, dietary fibers, polyphenolic compounds, polysaccharidases, phytosterolic compounds. | [9]        |
| Anti-cancerous                                | Alkaline, flavonoids, chlorophyll; tricin; Sodium Oxide Dismutase  | Beta-glucan, phenolic compounds, arabinoxylanes, phytosterolic compounds, lignans, resistant starches                              | [10,11]    |
| Anti-oxidative effects                        | Chlorophyll; lutoanin, saponarin; isoorientin, orientin; γ-tocopherol, glutathione; Sodium Oxide Dismutase, flavonoid, (GABA)        | Polyphenolics, anthocyanides, tocotrienols, polysaccharidases, (GABA)  | [12,13]    |
| Immunomodulatory effects                      | Arabinoxylan; polysaccharide, Gamma amino butyric acid   | Beta-Glucans, Arabinoxylan's   | [14,15]    |
| Cardioprotective effects                      | potassium, Gamma amino butyric acid  | Beta-D-Glucan  | [16]       |
| Blood pressure regulatory effect              | Saponarin; lutoanin, potassium, Calcium; Gamma Amino Butyric Acid  | Beta-Glucans   | [17]       |
| Bowel health regulatory effect                | Soluble and Insoluble fiber  | Beta-Glucans, Soluble and insoluble Fiber  | [18]       |
| Anti-preventative effect against CVD          | Saponin; tryptophan's, vitamins (retinol, Thymine, tocopherol), Sodium Oxide Dismutase; Potassium, Calcium; Gamma Amino Butyric Acid | Beta-Glucans, Arabinoxylan's, polyphenolic compounds, phytosterolic compounds, lignans, tocolic compounds, folic acid              | [19-20, 5] |

**Table 1:** Functioning Ingredients in Barley grass and Barley grain against chronic Illnesses

## CONCLUSIONS

Barley (*Hordeum vulgare* L.) is the world's fourth most significant cereal grain, with the greatest fibre composition, and can be utilized in a variety of industries for a variety of uses. Regular consumption of whole wheat grain and its hydroethanolic extracts decreases the risk of chronic ailments such as hyperglycemia, malignancy, overweight, cardiac disease, and so on. Barley and its products had gained an importance due to its counteractive components which play potent role against cardiovascular diseases.

## Conflicts of Interest

The authors declare no conflict of interest.

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