

Oral Hygiene Status in Bodybuilders taking Protein Supplements and Non Protein Supplements

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Abstract:-

AIM: The aim of this study was to investigate the effects of protein, creatine, and amino acid supplements on the dental health of physique builders. A comparison was made between the oral health status of bodybuilders who take protein supplements and those who do not.

METHODS: This cross sectional observational study was conducted in city of Pune, Maharashtra, India. survey was conducted and executed in months of August to October 2023. Clinical examination and data collection was mainly done at gym training centres in local areas of Pune City to collect the data from target population I.e. Bodybuilders.

RESULTS: Comparison between bodybuilders taking protein supplements and non protein supplements gave highly significant difference in P value of DMFT (Decayed missing, filled), OHI-S (Oral hygiene index simplified) and GI (Gingival index). Bodybuilders Taking supplements showed higher mean values

CONCLUSION: Participants in the study who were protein supplements taking bodybuilders had significantly higher mean SD and DMFT, OHIS and GI scores than non protein taking bodybuilders. Furthermore, consuming more protein on a regular basis may be directly linked to greater dental caries accumulation and gingivitis, but consuming different types of supplements—whether protein-based or a combination of supplements—may be linked to plaque and gingival scores. The cause of bodybuilders' oral hygiene because of protein supplements also can be associated with negligence towards oral health, presence of habits, improper brushing habits

Keywords:- Protein supplements, bodybuilders, oral hygiene, creatine, amino acids.

I. INTRODUCTION

Exercise helps us keep physically active. Being physically active can improve our brain health, help manage weight, reduce the risk of disease, strengthen bones and muscles and improve your ability to do everyday activities¹. "If exercise could be packaged in a pill, it would be the single most widely prescribed and beneficial medicine in the nation."-Robert Butler, National Institute on Aging².

One of the most advantageous and newly emerging exercise is bodybuilding. Bodybuilding should begin in the late teens or early twenties. Because puberty is the time when muscle grow the fastest, the two hence are intimately associated¹. Bodybuilding has a number of positive health effects. Bodybuilders frequently engage in physical activity to maintain and grow their muscles, including resistance and aerobic training. Muscle strength and size are increased by Resistance training, which involves working your muscles against a weight or force. Using free weights, weight machines, resistance bands, and your own body weight are some of the various resistance training methods³. The rate at which oxygen is transferred from the heart and lungs to the bloodstream and used by the muscles is accelerated during Aerobic Training. Athletes that are aerobically fit may work out harder and longer without getting exhausted. They have greater energy, less muscle exhaustion, a slower breathing rate, and a slower heart rate while they exercise. Recovery occurs faster after exercise. In a lab environment, aerobic fitness can be assessed while riding on a bicycle or treadmill. This is referred to as VO₂ max, or maximal oxygen uptake¹. In addition to promoting muscle growth, body building is believed to benefit bone health. One of the physical activities that prevents bone loss is still resistant training. The fragility of our bones can be related to aging, calcium or Vitamin D insufficiency and loss of muscle mass³

According to MD Anderson Wellness Dietitian Lindsey Wohlford, "macronutrients are the nutritional components of food that the body needs for energy and to maintain the body's structure and systems." Proteins, carbohydrates and fats are the essential macronutrients required by our body of which proteins are commonly known as building blocks of our body. Protein helps repair and build your body's tissues. It drives metabolic reactions, maintains pH and fluid balance, and keeps the immune system strong. It also transports and stores nutrients and can act as an energy source⁴. Protein has a modest Recommended Dietary Allowance (RDA) of 0.8 grams per kilogram of body weight, or 0.36 grams per pound that is roughly equivalent to two meals of meat, fish, nuts or tofu per day⁵.

In order to build muscle growth, enhance exercise recovery, and enhance performance, athletes, recreationally active individuals, and soldiers frequently use protein supplements. In order to acquire high protein intakes (up to three times the recommended daily allowance), which are beneficial for the growth of muscle and strength, bodybuilders and other strength athletes frequently use protein supplements. Meeting daily demands is essential to maximise the accumulation of lean mass because protein is a crucial macronutrient for fostering muscle growth. Various

types of proteins like Pea protein, casein protein, whey protein and soy protein have been used by bodybuilders for gaining muscle mass, of which the most commonly used protein is whey protein. Whey protein is derived from milk is highly regarded for its excellent amino acid profile, fast absorption rate and effectiveness in promoting muscle growth. Whey protein is a complete protein, which means it contains all of the essential amino acids needed by the body to function properly. Whey protein also contains a branched-chain amino acid called leucine, which helps increase lean muscle mass. Whey is generally regarded as the highest-quality protein source due to its favorable amino acid content and easy absorption. It can sometimes be added to food products, but it can commonly be seen on its own as a powder supplement. The three primary types of whey protein are Whey protein concentrate (WPC), Whey protein isolate (WPI), Whey protein hydrolysable(WPH)⁶.

Whey protein (WP) is a high-quality protein that contains more essential amino acids (EAAs) than other protein sources, is quickly digested, absorbed, and used, and boosts blood amino acid concentrations and muscle protein synthesis (MPS) for up to two hours when compared to an equivalent or higher dose of casein. For good oral health, protein is a crucial macronutrient. Higher protein intake is related to good dental health, which includes having the right number of teeth and being able to chew food well. When breaking down protein, your body creates a lot of acid, which is awful for your teeth. Gum disease, tooth decay, and other issues with oral health may result from this. Because many high-protein foods people consume are heavy in both total and saturated fat, consuming too much protein can also cause blood lipid levels to rise and increase your risk of heart disease. People who are susceptible to kidney disease are at an increased risk due to increased protein intake, which can strain the kidneys. Digestional problems could result. Also when a protein shake is consumed, one may notice a gritty residue on teeth after swallowing. Powdery drinks may leave this film behind. Plaque formation is aided by the presence of such particles on your teeth. Plaque erodes your teeth, leaving them vulnerable to dental hazards. McManus notes that using a milk-based protein powder can cause digestive pain in people who have dairy allergies or difficulty digesting lactose (milk sugar)⁷.

Every effort should be made to spread the word regarding the impact of supplement consumption on bodybuilders' oral health as they are regarded new risk groups and the majority of dental professionals are unaware of them. Bodybuilders should also be aware of the impact that irregular lifestyle choices have on their mouth health⁸.

The association between bodybuilders' supplement use and oral health has not been thoroughly examined in many studies. In order to better understand how protein, amino acid, and creatine supplements affect bodybuilders' dental caries and gingival health, this study looked at those supplements' effects.

II. METHODOLOGY

This cross sectional observational study was conducted in metropolitan city of Pune, Maharashtra, India. This survey was conducted and executed in months of August to October 2023. Clinical examination and data collection was mainly done at gym training centres in local areas of Pune City to collect the data from target population I.e. Bodybuilders. All participants received an overview of the study's goals at the outset, and their informed consent was obtained.

A. SAMPLE SIZE AND SAMPLING TECHNIQUES

Sample size was based on non probability convenience sampling technique based on statistical analysis made by statistician. Sample size selected was taken as 100 bodybuilders,

- 50: protein supplements taking bodybuilders (healthy individuals taking muscle supplements such as amino acids , creatine)
- 50: non protein supplement taking bodybuilders(healthy, exercising individuals not taking protein supplements).

Age group of 18 to 40 years of healthy individuals including both males and females And at least 20 – 25 intact teeth. Habits such as smoking tobacco , smokeless tobacco pan , alcohol were excluded , also

Individuals with 1) Systemic Diseases; 2) Old age people; 3) Orthodontic patients, Were excluded from the study.

B. PREPARATION OF PERFORMER:

Performer consisted of following data groups , 1) demographic details (such as name , age , occupation), 2) habits (smoking, smokeless tobacco, pan, alcohol), 3) Oral hygiene practices (such as time, frequency of brushing), 4) whether the individual take proteins supplements , if yes since when, 5) Relevant Indices (DMFT, OHI-S, GI).

C. DATA COLLECTION:

Data was collected at various gyms in the pune City. Firstly demographic details were recorded and clinical observation of Bodybuilders from both the groups was made as follows, For oral hygiene status OHI-S , oral hygiene index- simplified was taken including 6 teeth(16,11,26,36,31,46) if any of the teeth were missing adjacent teeth of respective teeth was recorded clinically.

For Dental caries DMFT :- Decayed(D), missing(M), filled(F) teeth of all teeth present and absent are marked by respective initials such as (D , M , F).

For gingival inflammation GI (Gingival index) : it was measured by probing depth of 4 surfaces (buccal , lingual/ palatal, mesial, distal,) of 6 selected teeth (16, 12,24, 44 , 32, 36) if any of the selected teeth is missing, GI of all the teeth were taken. All the results and interpretation were made based on standard scoring system of respective indices .All the Data was entered in Microsoft excel and statistical analysis were performed. Results were presented in terms of tables and graphs.

Table 1: Comparison of age parameter between Group A(Protein supplement) and Group B (Control) among bodybuilders in Pune city

	Mean	SD	Unpaired t test	P value significance
Group A(Protein supplements)	26.5	4.09	t= -0.2	P=0.984
Group B (Control)	26.52	5.91		

p>0.05 – no statistical significant difference

Table 2: Gender Distribution between Group A(Protein supplement) and Group B (Control) among bodybuilders in Pune city

	Male N%	Female N%	Chi square test	P value significance
Group A (protein supplements)	42 (84%)	8 (16%)	Chi=0.078	p =0.779 (NS)
Group B (Control)	43 (86%)	7 (14%)		

p>0.05 – no statistical significant difference

Table 3: Comparison of DMFT score between Group A(Protein supplement) and Group B (Control) among bodybuilders in Pune city

DMFT	Mean	SD	Unpaired t test	P value significance
Group A (protein supplements)	3.74	1.48	t=4.922	**p< 0.001
Group B (Control)	2.4	1.22		

**p< 0.001 – highly significant difference

Table 4: Comparison of OHI-S score between Group A(Protein supplement) and Group B (Control) among bodybuilders in Pune city

OHI-S	Mean	SD	Unpaired t test	P value Significance
Group A (protein supplements)	2.15	0.82	t=6.479	**p< 0.001
Group B(Control)	1.25	0.53		

**p< 0.001 – highly significant difference

Table 5: Comparison of GI score between Group A(Protein supplement) and Group B (Control) among bodybuilders in Pune city

GI	Mean	SD	Unpaired t test	P value significance
Group A (protein supplements)	1.08	0.44	t= 8.410	**p< 0.001
Group B (Control)	0.36	0.41		

**p< 0.001 – highly significant difference

III. RESULTS

The study included over 100 men and women with a mean age of 26.5 years(table 1). P value significance(p) is 0.984 as the age group was taken same in both the groups i.e. 18 to 40 years.84% of men and 16% women in group A (protein supplements) and 86% men and 14% women in group B (non protein supplements) p = 0.779 .(table 2)

Table 3 showed how group A and group B's mean score compared in terms of D, M, F, and DMFT. Statically there was a highly significant difference (p<0.001) in which mean of group A was higher (3.74) whereas group B (2.4) .

Table 4 is comparison of OHI-S scores mean of group A is 2.15 and group B is 1.25 (p<0.001)which is statistically ahghly significant difference. In table 5 comparison of GI scores is given, mean of group A 1.08 and group B 0.36 (p< 0.001).

IV. DISCUSSION

Bodybuilding is one of the most beneficial and recently popular forms of exercise. The late teens or early twenties are the best times to start bodybuilding. Muscle grows at its fastest rate throughout puberty, hence the two are closely related⁹.

Elevations of glucose and sucrose are closely correlated with an increase in demineralization. It was discovered that regularly consuming a protein supplement on a daily basis is equal to 107.9 g of sugar. This could account for the higher incidence of dental caries in bodybuilders as well as the considerable positive correlation between dental caries and increasing protein intake. This could be further supported by the correlation found between frequent sugar consumption and a lower salivary pH level than 5.5¹⁰.

Protein intake and combination supplementation (protein, creatine, and amino acids) exhibited a negative and statistically significant relationship with gingival inflammation and plaque buildup, according to MAHMUD ET AL. This indicates that there was an improvement in gingival and dental health when these supplement intakes were increased¹⁰¹¹. Contrary to what our study demonstrates, bodybuilders who consumed protein had significantly higher mean SD and DMFT, OHIS, and GI scores than those who did not. This suggests that regularly ingesting more protein may be associated with an increased risk of dental caries and gingivitis because of intake of protein supplements at night, lack of proper brushing and increase in carbohydrate intake for weight gaining and bulking. Carbohydrate played important role in increase in caries activity and lowering salivary pH.

Knight et al. conducted research and discovered a correlation between high supplement use and poor oral health, which is consistent with our findings about the rise in participant protein intake and the prevalence of caries and gingivitis¹².

As per SPENCE JE ET AL subjects who took protein and supplements, respectively, had poor oral hygiene, which they noted could be related to the individuals' inadequate oral hygiene practices^{13 14}.

A positive link was discovered between the average amount, frequency, and duration of protein supplement intake and DMFT, gingivitis, and OHI-S. concluded that there may be a connection between periodontal health and protein supplements and that bodybuilders had a noticeably greater incidence of gingivitis and caries. One of the factors contributing to the rise in oral health issues is improper brushing. Because they consume less sugar and brush properly, participants who do not take protein supplements have lower rates of dental caries and gingivitis.

V. CONCLUSION

The mean SD, DMFT, OHIS, and GI scores of bodybuilders who consumed protein were significantly greater than those of non-bodybuilders. As dental caries is a multifactorial entity and hence factors that may include can be an increase in the sugar content of protein supplements, Potentially, night time protein consumption coincides with improper brushing technique and ignorance of the need to brush at night.

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