

## Emerging Trends to Prescribe Multivitamins

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### Research Article

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### Abstract

The use of multivitamins and nutrients are increased to a great extent in past few years. Multivitamin / mineral supplements are commonly used as nutrient supplement. Most of them contain about 10 vitamins and minerals having different doses. Many individuals use these supplements as pre-emptive and to alleviate diseases as well. The trend of self-prescription of vitamins is increasing now-a-days which in turn is being converting to the irrational use of vitamins. In this effort we evaluated the prescribing trends of the multivitamins in different departments of hospital like orthopedic, gynecology. Retrospective analysis was carried out to evaluate. A questionnaire was designed to evaluate the prescribing ratio of multivitamins in human patients. Total number of patients was 70 in which 17 were male and 53 were female. Out of 70 patients, 49% prescriptions contained combination of multivitamins and nutrients containing vitamin A, D, E, B-complex, and calcium as 9%, 4%, 4%, 7% & 3% respectively. Percentage of the patients suffering from orthopedic, gynecology, gastrointestinal disturbance, hepatic insufficiency and of anemia was 27%, 20%, 16%, 12%, 2%, and 9% respectively. Study showed that the age group of 27-45 was more prone to disease and received multivitamins which was 43%. Least percentage was of age group 12-26 and that was 14%. It was seen that the deficiency of vitamins mostly due to lack of awareness and poor dietary intake. Early detection of vitamin level can lead to better prognosis.

**Keywords:** Multivitamins; Prescription; Emerging Trends

### Introduction

The use of multivitamins and nutrients are increased to great extents in past few years [1]. Industries

manufacturing micronutrients are being observed as the rapidly growing industries in the world [2]. Multivitamin supplements provide beneficial effects but on their excessive use they can cause serious adverse affects [3]. Although, multivitamin / mineral supplements are most

commonly used nutrient supplement. Most of them contain about 10 vitamins and minerals having different doses. Many individuals use these supplements as pre-

emptive and to alleviate diseases as well [4]. There are some vitamins and minerals with doses describe in the following table.

Nutrient's	Recommended daily intake/ parenteral intake	Sign and symptoms of deficiency	Signs and symptoms of toxicity	Sources of vitamins and minerals
Vitamin A	900mcg/3,300IU	Night blindness, conjunctivalxerosis		Egg, milk, meat, fish liver oil, $\beta$ carotene, papaya
Vitamin D	5-15mcg/200IU	Rickets/osteomalacia	Hypocalcaemia, hyperphosphatemia	Formed in skin when exposed to sunlight, egg yolk, yeast
Vitamin E	15mg/10IU	Extremely rare	Functional inhibition of vitamin K	Seeds, found primarily in the plant oil, vegetables
Vitamin k	120mcg/150IU	Hemorrhagic disease of newborn, impaired blood clotting	Hemolytic anemia, kernicterus, flushing dyspnea	Bacterial synthesis in the digestive tract, green leafy vegetables
Vitamin B1	1.2mg/6mg	Irritability, fatigue, headache	Lethargy and ataxia	Found in many foods, legumes, beans
Vitamin B2	1.3mg/3.6mg	Cheilosis, glossitis	None	Milk, yogurt,
Vitamin B3	16mg/40mg	Pellagra dysesthesias, vertigo	Flushing, hyperglycemia, hyperuricemia	Tuna, dairy, meat, whole grains
Vitamin B6	1.3-1.7mg/6mg	Depression, confusion, irritability, disorders of amino acid metabolism	Peripheral neuropathy, photosensitivity	Green leafy vegetables, meat, fish, fruits
Vitamin B7	30mcg/60mcg	Mental status change, myalgias, anorexia	none	Animal products
Vitamin B9	400mcg/600mcg	Bone marrow suppression	May lower seizures threshold in those taking anticonvulsants	Wide spread in food
Vitamin B12	2.4mcg/5mcg	Anemia, depression	None	Green leafy vegetables
Vitamin C	90mg/200mg	Scurvy	Nausea, diarrhea	Abundant in most fresh fruits
Chromium	30-35mcg/10-15mcg	Glucose intolerance, peripheral neuropathy	Gastritis, skin irritation	Unrefined whole grain cereals, fats
Copper	900mcg/300-500mcg	Thrombocytopenia, neutropenia	Nausea, vomiting, coma, hepatic necrosis	Liver, nuts, seeds, whole grains
Iodine	150mcg	Thyroid hyperplasia, hypothyroidism	Hypothyroidism blocks thyroxin synthesis	Iodized salt and plants
Iron	8mg/1.0-1.5mcg	Fatigue, anemia, koilonychias	Hemosiderosis, followed by disposition in liver, heart, pancreas	Red meat, eggs, fish, liver
Manganese	2.3mg/60-100mcg	Hypercholesterolemia dermatitis, dementia	Parkinonian type symptoms	Rice, dry fruits, nut
Selenium	55mcg/20-60mcg	Myalgias, kashinbeck disease	Irritability, peripheral neuropathy, hair loss	
Zinc	11mg/2.5-5.0mcg	Poor wound healing, diarrhea, dysgeusia, infertility	Gastric erosions, low HDL, fatigue	
Molybdenum	45mcg/45mcg	CNS toxicity, hypouricemia	Hyperuricemia +gout	Legumes, grains, organ meats

Table: List of Multivitamins(Godara 2013).

Multivitamins are prescribed for people who are not on special diet or the persons unable to take sufficient vitamins from their food they eat. Multivitamins contains multiple vitamins which essential to help our body functions. If you are on special diet or unable to get proper food then doctors prescribe multivitamins and micronutrients to fulfill body's requirements. There are many good reasons to take multivitamins. A multivitamin is not a substitute for healthy diet but it can provide a nutritional back up for a less than ideal diet. Dietary guidelines for American (2015-2020) identified vitamin A, vitamin D, calcium, sodium, potassium and dietary fibers as nutrients for concern in inadequacy of dietary intake (Health and Services 2015). There are very low incidences of cancer and cataract because of daily low dose of MVM (anti-oxidants).

### Vitamin A

Vitamin A is a fat soluble vitamin which is stored in the liver of human body. It contains retinoid and carotenoids. Vitamin A which are obtained from vegetables known as carotenoids and which are obtained from animal sources called retinoid. It synthesizes the pigment of eye i.e. retina so deficiency of the vitamin A leads to eye problems such as night blindness and corneal damage. Dietary sources of vitamin A are eggs, cod liver oil, oranges and yellow vegetables, fortified skim milk. Vegetables and fruits containing carotene are fat/cholesterol free [5]. Deficiency of vitamin A is also a cause of immunodeficiency disorder.

### Vitamin B complex

Vitamin B complex is the water soluble vitamins which are essential for metabolic activities in the body. These vitamins are in the category of essential vitamins that are not synthesized by body. Vitamin B complex includes B1, B2, B3, B5, B6, B7, B9 and B12. These are required for functioning of all living cells in the body. Most often the B complex are prescribed together for better result [6]. Studies showed that the vitamin B complex is also used as analgesics. Vitamin B1 (thiamin), B12 (cyanocobalamin) and B6 (pyridoxine) are good choices for analgesic effects. A review indicates that the patients having neuropathic pain taking b-complex for 12 weeks showed reducing the neuropathic symptoms. Another study showed the reduction in the neuropathic symptoms after taking b complex for 60 days daily. In this way, for several years vitamin B has been used either alone or in combination with other anti inflammatory/ analgesic for the treatment of neuropathy, rheumatic disease and in degenerative disease of spine [7].

### Vitamin C

Vitamin C is the water soluble vitamin which is necessary for the body's growth and development. There are several important roles of vitamin C from which the major one is as an anti oxidant. Intravenous and oral vitamin C helps in reducing infections, improve wound healing, boost up the body's immune system. Deficiency of vitamin C lead to severe condition of scurvy [8]. Food rich in vitamin c is containing citrus foods/fruit, strawberry, guava, melon etc.

### Vitamin D

Vitamin D is fat soluble vitamin which is important for the health of bones. There are two components of the vitamin D i.e. D2, D3 obtained from plant food, fortified food. D3 is also called ergocalciferol. Deficiency of the vitamin D is caused by inadequate sun exposure or inadequate diet containing vitamin D. Different researches shows that the deficiency of vitamin can lead to cardiovascular problems [9]. Osteoporosis, muscular weakness, occurs because of the lack of vitamin D.

### Vitamin E

Vitamin E (alpha tocopherol) is also fat soluble vitamin which is used as anti oxidant. Food sources of vitamin E are nuts, vegetable oils. Significant amount present is green leafy vegetables. According to previous studies based upon vitamin E revealed that the dietary supplement with high amount of vitamin E can lead to the prostate cancer in men [10].

### Vitamin K

Vitamin K which is essential vitamin (not synthesized from body) also play vital role in body's physiological functions. It is a co factor for the synthesis of  $\gamma$  carboxy glutamic acid. It is used as coagulant as  $\gamma$  carboxy glutamic acid contain 14 proteins including 4 blood coagulation proteins i.e. prothrombin, factor VII, factor IX and factor X [11]. Bioflavonoid (vitamin p) is also used as supplements. These are known as semi essential nutrients.

### Minerals

Several minerals are necessary for life in small quantity such as calcium, sodium, potassium, magnesium, phosphorus etc. Mineral deficiency cause serious type of problems like osteoporosis. For the management of osteoporosis, calcium and vitamin D prescribed together. Calcium supplement with or without vitamin D can cause cardiovascular diseases [12]. Potassium supplementation

is associated with considerable reduction of blood pressure. Hence, high intake of potassium is recommended for treatment of hypertension especially for those patients who cannot reduce their sodium level in the body [13]. Likewise, maternal iodine supplementation is necessary for the neurobehavioral development in the offspring. But the high intake of iodine can lead to the thyroid dysfunction. So, it is important to consider the benefit and risk of using iodine supplements [14]. Iron is essential trace element which is used mostly as nutritional supplements. Iron deficiency causes anemia associated with reduced work capacity. Loss of iron in the body can also induce the premature delivery, still birth in expected mothers [15]. Furthermore, marginally low birth weight infants are at high risk of iron deficiency anemia especially when they are on breastfeeding. Zinc is also an important element for body. Deficiency of zinc causes poor night vision and wound healing, decrease in sense of taste and smell and poor development of reproductive organs.

## Materials & Methodology

### Study Area

Retrospective analysis was carried out on patients who were prescribed multivitamins, in Jinnah hospital Lahore, and from different private clinics. Patients were allotted in different shifts either in morning, afternoon based on their preferences. Study was approved by institutional review board. The patient disease history, outcome and patient satisfaction to multivitamins etc were collected retrospectively.

### Study Design

Retrospective study

### Study Population and Status

A survey was conducted during August 2016 and September 2016 in different days to each hospital. About 100 questionnaires were filled randomly in different patients from medicine ward, gynaecology ward, Orthopaedic ward etc. Data collection was done by self-administered questionnaire. All other ethical requirements including verbal consent and confidentiality were ensured.

### Study Tools

Questionnaires were filled according to patient disease history, age group, gender and type of vitamins prescribed.

### Consent

Objective of the study were explained to the patients and the questionnaire were filled only by those who agreed.

### Data Collection

The data was collected using the patient data collection form and by direct patient interview. Consultation from physician and nursing staff was taken when necessary. Outcomes were compared on the basis of gender, disease history, age group and vitamins prescribed.

### Results

Out of 70 patients 17 were male and 53 were female. The ratio of female patients is more than male patients because folic acid in before and after pregnancy can help prevent birth defects of baby's brain and spinal cord. Use of minerals/multivitamins among female population is high and most commonly used supplements are vit C, A, B, iron and calcium.

### Age Limit

Out of 70 patients, 10 patients were of age 12-26, 30 patients were of age 25-45, 18 patients were of age 46-64, and 12 patients were of age 65+.

The age group 27-45 was more prone to disease and studies show mostly patients are suffering from orthopaedic and gynaecological disorders.

### Disease History

Out of 70 patients: 19 patients were of orthopaedic disease, 5 patients were of anaemia, 14 patients were of gynaecology, 4 patients were of CNS, 11 patients were of GIT, 1 patient was of pulmonary, 8 patients were of hepatic, 1 patient was of respiratory, 1 patient was of PCO, 1 patient was of malnutrition, 3 patients were of renal disease, and 1 patient was of multiple disease.

Mostly multivitamins are prescribed in orthopaedic (e.g. combination of Vit D and calcium) and gynaecological disorders (e.g. combination of folic acid and iron).

### Vitamins Prescribed

Out of 70 patients, Vit A was prescribed to 6 patients Vit D was prescribed to 3 patients Calcium was prescribed to 2 patients Vit B6 was prescribed to 3 patients. Combination of iron and folic acid was prescribed to 4 patients. Combination of Vit D and calcium was

prescribed to 10 patients. Combination of Vit B complex was prescribed to 5 patients. Combination of different vitamins was prescribed to 34 patients.

## Discussion

In country like Pakistan there are many patients of different age groups suffering from different diseases are prescribed with multivitamins. The ratio of female patients is more than male patients because folic acid in before and after pregnancy can help prevent birth defects of baby's brain and spinal cord. Use of minerals/multivitamins among female population is high and most commonly used supplements are vit C, A, B, iron and calcium. The cost of the therapy is economical for the patients. Studies revealed patients of age group 27-45 are more prone to disease and studies show mostly patients are suffering from orthopaedic and gynaecological disorders.

Previous researches show that there are several vitamins prescribed to cure the disease or to decrease the chances of occurrence. Calcium or potassium supplements (1.2%), Multivitamins (2%), were prescribed to treat the stroke in a prescription pattern [16]. A prospective observational study presented the data comprises of prescribed water-soluble vitamins in different regions. Patient use water-soluble vitamins, was associated with a substantially and significantly lower risk for mortality [17].

A cross sectional study shows that about 49% individuals used dietary supplements which are prescribed by their physicians in United States. Among these prescription, about 52% individuals used dietary supplements with other medications [18]. A survey reported that 73% of US non institutional adults used dietary supplements from previous 1year. And 12% of them experienced unwanted effects. This self-reported data shows the prevalence of unwanted effects caused by multivitamins and multi-minerals. A higher proportion of supplement users is with adverse effects than without adverse effects [19].

Another cross sectional, population-based survey reported the percentages of individuals used dietary supplements. The ratio of women used supplements is higher than men. It is also reported that women are more prone to use calcium supplements for bone health (36%) and men are more likely to use the supplements that lower the cholesterol level (18%). Older adults more than 60 years were mostly prescribed than younger ones [20]. In our study the there are 76% female and 24% male. One

of the reasons is menstrual cycle. Poor dietary intake, gynecological problems are also causes of deficiency of vitamins among women. The age range in our study is 27 to 45 years to which vitamins are prescribed mostly by their physicians. The reason is the cones and joint health as study shows that the most patients who received MVMs are of orthopaedic. Research revealed that patients who comply with the therapy their quality of life are improved. Multivitamins are mostly prescribed in combination of the ratio of self-prescribing supplement e.gvit A, B6, B12, Vit C, Vit E, thiamine, niacin, pantothenic acid and foliate are prescribed on daily basis is high.

## Conclusion

To sum up the above data and discussion it is concluded that multivitamins are prescribed mostly to patients with orthopaedic and gynaecological disorders. Counselling the patients on the use of multivitamins is essential to improve their health and quality of life. Mostly, vitamin deficiency persists in lower class people of the country due to lack of awareness, malnutrition, socioeconomic reasons, and cultural beliefs. Early detection of levels of vitamins in the body can lead to better prognosis.

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