ISSN: 0975-3583, 0976-2833 VOL14, ISSUE12, 2023

PREVALENCE OF IRON DEFICIENCY ANAEMIA IN WOMEN WITH DYSPHAGIA

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ABSTRACT

Introduction: Difficulty in swallowing or dysphagia is a common symptom. Prolonged dysphagia over a period of days and months can lead to mild to severe malnutrition which also includes iron deficiency anaemia.

Aims: To know the prevalence of iron deficiency anaemia in middle aged female patients presenting with complaints of dysphagia in otorhinolaryngology department of tertiary care hospital of rural India.

Materials and methods: Prospective study was conducted to investigate the association of iron deficiency anemia with dysphagia in an adult female Indian hospital population of 100 patients. Those 100 patients were divided into study group(with dysphagia) and control group(without dysphagia).

Results: There were 18% and 8% of patients having iron deficiency anemia in the study group and control group respectively. Prevalence of iron deficiency anemia is more in dysphagic patients than non-dysphagic patients. Patients with dysphagia and iron deficiency anemia are at high risk of developing post cricoid carcinoma.

Conclusion: Prevalence of iron deficiency anemia is more in dysphagic patients than non-dysphagic patients. In this study , patients with dysphagia were more from middle age group.

Keywords: Iron deficiency anemia, Dysphagia, post cricoid carcinoma, middle aged female.

INTRODUCTION

Dysphagia is defined as having difficulty in swallowing which may affect any part of the swallowing pathway from mouth to stomach. [1] In the middle aged patients following conditions can cause prolonged dysphagia like reflux esophagitis ,hiatus hernia ,anemia

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE12, 2023

,achalasia cardia, globus syndrome ,cancer and neurological disorder.[2] Prolonged dysphagia over a period of days and months can lead to mild to severe malnutrition which also includes iron deficiency anaemia. Physiologically middle aged women are more dependent on nutrition to maintain their body iron stores.

One of the reasons for dysphagia in middle aged females is iron deficiency anemia . Blood indices include or preclude anaemia as a cause or effect of the dysphagia . Iron deficiency anaemia, female gender and dysphagia are the noted risk factor for post cricoid carcinoma. Iron deficiency anemia is not a disease . but rather a symptom of some underlying disorder. Dysphagia can cause significant morbidity and mortality. Iron deficiency anaemia is common nutritional deficiency in rural India. The proportion of anaemia caused by iron deficiency increases to over 70% among premenopausal women in India. It causes reduced work and fatigue in adult women. [3] Many patients present in otorhinolaryngology department with complaints of dysphagia. Blood investigations like serum iron and total iron binding capacity include are preclude iron deficiency anemia in such patients presenting with prolonged dysphagia. This study is being carried out to asses prevalence of iron deficiency anemia in middle aged female patients presenting with complaints of dysphagia in our rural tertiary primary care hospital.

MATERIALS AND METHODS

Prospective study done in patients attending department of otorhinolaryngology in PESIMSR kuppam ,chitoor district Andhra Pradesh from October 2013 to august 2015. This study was approved by ethical committee of our college.

Inclusion criteria:-Female patients in the age above 35 years.
Exclusion criteria:-Female patients below the age of 35 years including pregnant and lactating women.

METHOD OF COLLECTION OF DATA:-

A total of 100 middle aged female patients were chosen for study. A detailed history was taken and out of 100 patients 50 patients with complaint of dysphagia and 50 patients without complaint of dysphagia underwent thorough clinical examination Severity of dysphagia was assessed subjectively . Patients having dysphagia history of more than 1month included in study.

Patients were subjected to blood investigations ,Hb% ,total iron binding capacity , serum iron .Reports were collected for all 100 patients which include 50 patients with dysphagia and 50 patients without complaint of dysphagia. The investigations were further analyzed for confirmation of iron deficiency anemia in the study and control group.

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RESULTS

Table-1: Distribution of patients belonging to study group and control group depending on age.

Age range (years)	Study group	Percentage	Control group	Percentage
36-45	26	52%	31	62%
46-55	11	22%	7	14%
56-65	5	10%	8	16%
>65	8	16%	4	8%

52% and 62% patients belong to study group and control group respectively ranging from 36-45 years, 22% and 14% patients belong to study group and control group respectively ranging from 46-45 years ,10% and16% patients belong to study group and control group respectively ranging from 56-65 years,16% and 8% belong to study group and control group respectively aged above 65 years.

Table-2: Mean, median and standard deviation of age , Hb% , serum iron levels and total iron binding capacity in study group.

Variables	Age(Years)	Hb%(mg/dl)	Serum iron (mcg/dl)	Total iron binding capacity (mcg/dl)
Mean	50.60	10.98	66.00	339.94
Median	45.00	10.95	65.20	303.80
Standard deviation	13.18	1.53	32.19	79.73

Mean , median and standard deviation of age are , 50.60 , 45 and 13.18 yrs. respectively.
Mean , median and standard deviation of Hb% are10.98 ,10.95 and 1.53 mg/dl respectively.
Mean, median and standard deviation of serum iron are 66.00, 65.20 and 32.19 mcg /dl respectively.
Mean, median and standard deviation of total iron binding capacity are 339.94 , 303.8 and 79.73 mcg/dl respectively.

Table-3: Mean , median and standard deviation of age, Hb% , serum iron levels and total iron binding capacity in control group.

Variables	Age(Years)	Hb%(mg/dl)	Serum iron (mcg/dl)	Total iron binding capacity (mcg/dl)
Mean	47.72	11.24	73.93	322.43
Median	45.00	11.00	72.45	301.45
Standard deviation	11.47	1.39	27.80	60.74

Mean , median and standard deviation of age are 47.72, 45.00 and 11.47 yrs. respectively.

Mean , median and standard deviation of Hb% are11.24 ,11.00 and 1.39 mg/dl respectively.
Mean, median and standard deviation of serum iron are 73.93 , 72.45 and 27.80 mcg /dl respectively.
Mean, median and standard deviation of total iron binding capacity are 322.43 , 301.45 and 60.74 mcg/dl respectively.

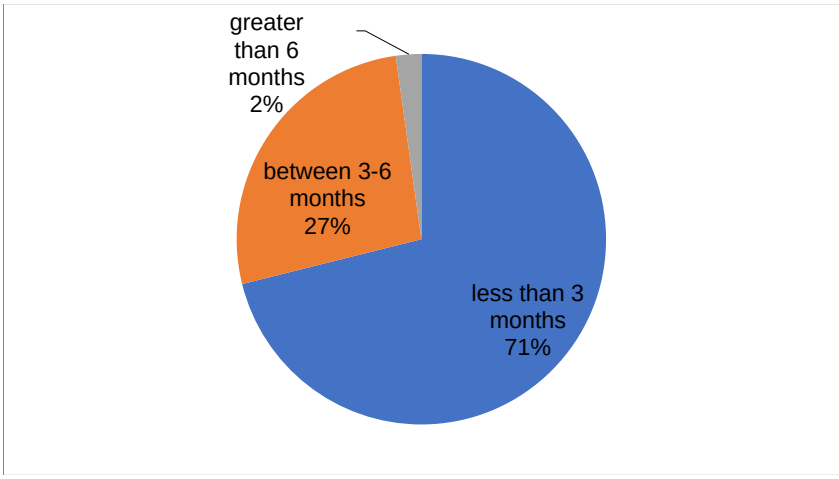

Figure-1: Distribution of study group patients depending on duration

64 % patients presented with dysphagia less than 3 months,24% patients presented with dysphagia between 3 to 6 months and 2 % patients presented with dysphagia more than 6 months in study group.

Table-4: Distribution of hemoglobin % (mg/dl), iron and Total iron binding capacity in study group and control group.

Hb% range(mg/dl)	**Study group**	**Percentage**	**Control group**	**Percentage**
Less than 8	2	4%	1	2%
8.1-10	7	14%	3	6%
10.1-12	29	29%	32	64%
12.1-14	12	24%	14	28%
Serum iron				
Less than 37 mcg/dl	10	20%	4	8%
Greater than 37 mcg/dl	40	80%	46	92%
Total iron binding capacity				
Greater than 497 mcg/dl	8	16%	3	6%
Less than 497mcg/dl	42	84%	47	94%

Hemoglobin percentage(mg/dl) less than 8 in 4% and 8% patients belonging to study group and control group respectively , from 8.1to 10 in 14% and 6% patients belonging to study and control group respectively , from 10.1 to 12 in 58% and 64% patients belonging to study and control group respectively, from 12.1 to 14 in 24% and 28% patients belonging to study group and control group respectively.

20% and 8% patients having serum iron(mcg/dl) levels less than 37 mcg/dl in study group and control group respectively,80% and 92% patients having serum iron levels greater than 37 mcg/dl in study group and control group respectively.

16% and 6% patients total iron binding capacity(mcg/dl) levels greater than 497 mcg/dl in study group and control group respectively,84% and 94% patients having total iron binding capacity levels less than 497 mcg/dl in study group and control group respectively.

Table-5:Showing cross table consists of total iron binding capacity and dysphagia as variables.

		Total iron binding capacity		**Total**
		More than 497mcg/dl	**Less than 497 mcg/dl**	
Dysphagia	present	42	8	50
	absent	47	3	50
Total		89	11	100

On doing , chi-square test , utilizing above table the point probability (p value) by linear-by-linear association is 0.074.

Table-6: Showing cross table consists of serum iron and dysphagia as variables.

		Serum iron		**Total**
		less than 37mcg/dl	**More than 37mcg/dl**	
Dysphagia	Present	10	40	50
	Absent	4	46	50
Total		14	86	100

On doing , chi-square test , utilizing above cross **table** the point probability (p value) by linear-by-linear association is 0.054.

DISCUSSION

Normal reference values differ as much as 35% between commercial methods. From a practical standard point if an automated commercial method is used , it is advised that a laboratory independently define its own reference intervals .In case of iron deficiency serum iron levels decrease or it can be normal and total iron binding capacity is increased. In this study ,the reference values laboratory test are taken ,which are being used in biochemistry laboratory of P.E.S hospital. The normal range of serum iron and total iron binding capacity are 37-170mcg/dl and 265-497 mcg/dl respectively in case of females .Serum iron less than

ISSN: 0975-3583, 0976-2833 VOL14, ISSUE12, 2023

37mcg/dl and total iron binding capacity more than 497mcg/dl considered iron deficiency. The evaluation of iron status in patients with anemia typically includes assessment of values for the traditional quantitative laboratory tests: serum iron concentration (SIC),total iron binding capacity.[4]

The diagnosis of iron deficiency anemia ultimately rests on laboratory studies. Both the hemoglobin and hematocrit are depressed, usually to a moderate degree, in association with hypochromia, microcytosis, and modest poikilocytosis. The serum iron and ferritin are low, and the total plasma iron-binding capacity (reflecting elevated transferrin levels) is high. Low serum iron with increased iron-binding capacity results in a reduction of transferrin saturation to below 15%. Reduced iron stores inhibit hepcidin synthesis, and its serum levels fall.

Three stages of iron deficiency have been described; First stage characterized by decrease storage of iron without any other detectable abnormalities. Second stage ,that is intermediate stage of latent iron deficiency that is iron stores are exhausted ,but anaemia has not occurred as yet. Its recognition depends upon measurement of serum ferritin levels. The percentage saturation of transferrin falls from a normal value of 30 percent to less than 15 percent. This stage is that of overt iron deficiency when there is decrease in the concentration of circulating hemoglobin due to impaired hemoglobin synthesis.

The end result of iron deficiency is nutritional anaemia which is not a disease entity. It is rather a syndrome caused by malnutrition in its widest sense.[5] In this study ,patients having hemoglobin percentage(Hb%) less than 10 mg/dl ,serum iron levels less than 37 mcg/dl and total iron binding capacity increased more than 497 mcg/dl were considered having iron deficiency anemia.

In this study 100 female middle aged women, visiting to otorhinolaryngology department were taken up for analysis. All were female patients aged above 35 years. Those 100 patients were divided into two groups . One group had 50 patients with complaint of dysphagia , which is a study group . Another group served as control group which constitutes 50 patients without complaint of dysphagia.

As shown in table-1, In this study minimum and maximum age of presentation was 35 years and 80 years respectively . Most of the patients belonged to middle age group, and peak incidence was seen between 35 to 45 years. Elderly patients aged above 65 years were 16%(n=8). In patients with dysphagia , mean , median and standard deviation of age at presentation was , 50.60 , 45.00 and 13.18 yrs. respectively in study group(table-2).
In study of Sanjay P. Kishve et.al[3] the age of the patients of dysphagia ranged from 0 – 80 years. Maximum cases were reported in the age group 20 – 70 years with peak incidence in the 5th decade of life (n=15, 27.78%) . Prasse and Kikano[6] had reported dysphagia to be a problem of elderly individuals. For Eslick and Talley[7] the prevalence of dysphagia showed a relatively normal distribution , peaking in the 40-49 year group.

In Thad Wilkin et.al , study patients presenting with dysphagia consisted more of women.[8]

Prolonged dysphagia is a debilitating condition leading to inability to take solids and also liquids in worst conditions . In women belonging to middle age group there is more demand of nutrition compare to other age groups to meet their physiological demands . In chronic conditions like gastro oesophageal reflux disease with or with strictures , plummer Vinson syndrome , globus pharyngeus and oesophageal carcinoma there is decreased intake of feeds for longer period which may lead to nutrition deficiency in the body . As women belonging to middle age group have more physiological demand , nutrition deficiency ensues on long standing dysphagia .In study by Ekberg O et al[9], over 50% of patients reported that they were eating less.
The combination of dysphagia with poor nutrition, significant weight loss, and impaired immune function often results in cachexia (full-body wasting and muscle atrophy), fatigue, high susceptibility to infection, poor wound healing, or death. As shown in figure-1 ,duration of dysphagia ranged between 1 month and 7 month , 64 % patients presented with dysphagia less than 3 months,24% patients presented with dysphagia between 3 to 6 months and 2 % patients presented with dysphagia more than 6 months.

In study of Sanjay P. Kishve et .al[3] duration of the illness was in the range of less than 3 months to up to 24 months. About 36% patients were having one or the other form of complaint of less than 3 months duration . However, for 39.3% study subjects , the presenting complaint was 3 to 6 months old . For 16.4% and 8.2% patients , the symptoms developed between 6-12 months and 12-24 months respectively. Wilkins et. al.[8] reported that more than one fourth (26.8%) of their patients were having problems in swallowing for less than 1 year , while about half of the study sample (47.4%) for 1 to 5 years.

On the basis of duration of dysphagia , patients were classified into three groups , i.e., from 3 to 12 weeks of dysphagia , 13–24 weeks and more than 24 weeks of dysphagia . Most of the patients 74 (53.2%) were having dysphagia for more than 24 weeks , followed by 54 (38.8%) in the 13–24 weeks group and 11 (7.9%) in the 3–12 weeks group.[2]

In this study, all were dysphagic to solids .In Thad Wilkins et.al[8] study the patients who reported dysphagia , 49.0% reported problems swallowing with solids only, 6.3% with liquids only , and 44.7% with both solids and liquids . Prevalence of iron deficiency anemia diagnosed in dysphagic group and non-dysphagic group by analyzing investigations like hemoglobin percentage ,serum iron and total iron binding capacity.

As shown in table-4, hemoglobin percentage (mg/dl) was less than 8 in 4% , from 8.1to 10 in 14% , from 10.1 to 12 in 58% , from 12.1 to 14 in 24% in patients who presented with complaint of dysphagia . Mean , median and standard deviation of Hb% are10.98 ,10.95 and 1.53 mg/dl respectively in study group(table-2).In this study patients having hemoglobin percentage less than 10 mg/dl were considered anemic. In 22% patients presenting with

dysphagia hemoglobin percentage was less than 10 mg/dl, similarly in 8% patients hemoglobin percentage was less than 10mg/dl presenting without symptoms of dysphagia. In study by koshla et.al[10] hemoglobin levels less than 10 g/dl were considered anemic and hemoglobin levels were between 7-10 g/dl in 22 cases, between 5-7 g/dl in 52 cases, 3-5 g/dl in 53 cases and less than 3-0 g/dl in 23 cases.

The laboratory investigation for serum iron and total iron binding capacity in all 100 patients(50 patients with complaint of dysphagia and 50 patients without complaint of dysphagia) was done. As shown in table-4, the percentage of patients having serum iron levels less than 37mcg/dl is more in study group compared to control group. Mean, median and standard deviation of serum iron are 66.00 , 65.20 and 32.19 mcg /dl respectively in study group(table-3). 20% and 8% patients had serum iron(mcg/dl) levels less than 37 mcg/dl in study group and control group respectively, 80% and 92% patients had serum iron levels greater than 37 mcg/dl in study group and control group respectively.

As shown in table-4, the percentage of patients having total iron binding capacity greater than 497mcg/dl is more in study group compared to control group. Mean, median and standard deviation of total iron binding capacity are 339.94 , 303.8 and 79.73 mcg/dl respectively in study group(table-3).16% and 6% patients total iron binding capacity(mcg/dl) levels were greater than 497 mcg/dl in study group and control group respectively,84% and 94% patients had total iron binding capacity levels less than 497 mcg/dl in study group and control group respectively.

In this study ,after taking hemoglobin percentage ,serum iron and total iron binding capacity into account the percentage of patients having iron deficiency anaemia is more in dysphagic patients than non-dysphagic patients .They all belonged to middle and elderly age group.

As shown in table-5, taking as dysphagia and total iron binding capacity as variables, chi-square test was done. The point probability by linear –by-linear association is 0.074. As shown in table-6, taking as dysphagia and serum iron as variables, chi-square test test was done. The point probability by linear-by-linear association is 0.054. The p value is considered significant if the value is less than 0.05. In this study p values can be considered nearly significant even though they are more than 0.05.On increasing the sample size of the study the p value becomes more significant.

Table-7:Comparison between our study and study by Sanjay.P. Kishve et.al

	Our study	**Sanjay et.al[3]**
Age group with dysphagia	Common in middle age group	Common in middle age group
Anaemia	18%	5%
Duration of dysphagia		
Less than 3months	71%	39.33%
3-6 months	27%	36.07%
Greater than 3 months	2%	34.06%

In follow-up studies in patients with a post-cricoid web or PVS, post-cricoid carcinoma was observed in 4%–16% of patients. In a case series from other countries, a high proportion of patients with hypopharyngeal carcinoma had preceding history of PVS.[11] In recent case series of PVS, up to 10% of patients developed malignant transformation during follow-up.[12,13] However, the exact mechanism for this is unknown. It is assumed that with long-standing iron deficiency, the atrophic mucosal changes become irreversible and, in some patients, progress to malignant degeneration.

CONCLUSION

In this study, patients attending to our otorhinolaryngology outpatient department prevalence of iron deficiency anemia is more in dysphagic patients than non-dysphagic patients. In this study , patients with dysphagia were more from middle age group.

Our knowledge about the association of PVS with malignancies of the upper gastrointestinal tract also remains limited. In view of these and the infrequent nature of the disease, a protocol-based data collection and management of such patients is needed to help improve our understanding about this disease, including its pathogenesis, optimum treatment and natural history.

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