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CORRELATION OF SERUM MAGNESIUM LEVELS WITH GLYCOSYLATED Hb AND DIABETIC COMPLICATIONS - A CROSS SECTIONAL STUDY

Medicine

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KEYWORDS

INTRODUCTION

- Diabetes mellitus a heterogenous group of metabolic disorders characterised by persistentchronic hyperglycaemia with deranged carbohydrate/ fat/ protein metabolism
- Incidence/prevalence– fast in creasing a cross the globe
- Worldwide prevalence of type 2DM isapprox. 439 million by 2030[1]
- Chronic/uncontrolled DM of tenis associated with long term micro/ macro vascular complications
- Several vitamins/ mineralslikevit E, Mg, K, Z netcactsasco factors in regulation of insulinsecretionandaction[2]
- Micronutrients–investigated as potential preventive/the rapeuticagents in type 2 DM and its complications[3]

Role Of Magnesium

- Magnesium is the 4th important cation in the body, hasarole in number of metabolic reactions like DNA /protein synthesis, neurotrans mission and hormone receptor binding[4]
- Mg has a role in carbohydrate metabolism, insulin secretion, insulin receptor in teraction, post receptorevents (tyrosinek in a semediated phosphorylation)[5]
- Incidence of hypo Mg in type 2 DM is 25-39%[6]
- Hypomagnesaemiamayinduceorworsendiabeticstateorits complicationslikeretinopathy[7]
- Sr.Magnesiumisinverselyrelatedtoseverityofdiabetesmellitus[7]

Present Study

- Objective
- ToestimatetheSr.Mglevelsintype2DMpatients To estimate HbA1C levels in all DM patients To identify the complications in all DM patients Toco-relate the Sr.Mglevels with HbA1c levels and its association with complications

- **Materialsandmethods**

Site: AkashinstituteofmedicalsciencesandresearchcentreSource :OPD and IPD patients
Timeperiod: 1st January2023to31st December2023

- **Inclusioncriteria**

Alltype2DMpatientscomingtoOPD/IPD Age > 18 yrs
Consentedforthestudy

- **Exclusioncriteria**

Patientswithrenalfailure,acuteMI,ondiuretics,onamoniglycosides,Mg containing antacids etc
Pregnancyandlactation

Methodology

- Thisisacrosssectionalstudyof90patientsvisitingAkashinstituteof medical sciences.
- 90type2DMpatientswereenrolledforthisstudy
- Detailed history (includingdiethistory) and clinical examination done
- Investigations–routine,ECG,FBS,PPBS,HbA1C,lipidprofile,RFT , SerumMglevels were estimated
- Fundusexaminationdone

RESULT

Table1- Genderd Is Tribution And Relation To Sr.mglevels

n	male	Female
90	54	36
HypoMg 32	20	12

Table2-DM Durationco-relationwithSr.Mglevels

DM duration	n	male	female	HypoMg
<5 yrs	14	2	1	03
5-10yrs	36	8	6	14
10-15yrs	28	8	3	11
>15yrs	12	2	2	04
Total	90	20	12	32

Table3–AgeandDMdistribution

Age	Male	Female	n
<20yrs	1	0	1
20-40yrs	4	2	6
40-60yrs	34	28	62
60-80yrs	15	6	21
n	54	36	90

Table4–medicationsandhypoMgco-relation

Medication	n	Hypo Mg
onOHA	60	22
oninsulin	08	03
onOHA+ insulin	22	07
Total	90	32

Table 5–HbA1cco-relationwithHypoMg

HbA1c	n	HypoMg
<7	26	06
7-8	10	07
8-9	30	08
>9	24	11
Total	90	32

Table 6– Relationoftype2DMwithSr.Mglevels

Sr.Mglevels	n	percentage
<1.8(hypoMg)	32	35.55%
1.8 –2.4	56	62.22%
>2.4(hyperMg)	02	2.22%

Table7– Association and Co-relation between co-morbidities and complicationsoftype 2 DM with HypoMg

Co-morbidities	male	female	n	HypoMg
HTN	18	06	24	06
IHD	04	01	05	01
Hypothyroid	01	03	04	00
COPD	04	00	04	02
Bronchial Asthma	01	01	02	00
Obesity	10	06	16	04
Diabetic complications				
Diabetic Retinopathy	22	08	30	19
Diabetic neuropathy	10	07	17	05
Diabetic nephropathy	08	06	14	04

Important Obsservation/Discussion

- HypoMg was observed in 35.5% of patients
- HypoMg was seen more in males(37.03%)
- HypoMgwasseenmoreinchronicdiabetics-38.88%in5-10yr group, 39.28% in 10-15 yr group and 33.33% in > 15 yr group
- HypoMgwasseenmoreinOHAgroup(36.66%)
- HypoMgwasseenmoreinuncontrolledDMpatients–40.62%inHbA 1c > 7.0 group
- HypoMgwasmoreassociatedwithdiabeticcomplications(31.11%)

- Hypo Mg was seen in 63.33% of patients with diabetic retinopathy, 29.41% with diabetic neuropathy, 28.57% with diabetic nephropathy.

CONCLUSION

- TheprevalenceofhypoMgintype2DMpatientsissignificant –35.55%andshows significant association with the microvascular complications of DM,especially DIABETIC RETINOPATHY.
- PrevalenceofhypoMgishigherinpatientswithpoorglycaemiccontrol,chronicityof diabetes and patients on OHA.
- Hence,diabeticpatientswithhypoMgrequireophthalmicscreeningtoruleout diabetic retinopathy regularly.
- RoutinemonitoringandcorrectingserumMglevelsintype2DMpatientsmayhelpin better control of HbA1c and delay progression to diabetic complications.

REFERENCES

1. Shaw JE, Sicree RA, Zimmet PZ.Globalestimatesoftheprevalenceofdiabetes for 2010 and 2030. Diabetesresearchandclinical practice. 2010 Jan 1;87(1):4-14.
2. WalterRM,BhandarkarSD.Traceelementsindiabetesmellitus.JPostgradMed.1981;27 :129-32.
3. MooradianAD,FaillaM,HoogwerfB,MaryniukM,Wylie-Rosett J.Selected vitamins and minerals in diabetes. Diabete scare.1994May 1;17(5):464-79.
4. ElinRJ.Assessmentofmagnesiumstatus.Clinicalchemistry.1987Nov1;33(11):1965-70.
5. ChiTP,MaiTP,SonVP,JaffreyMM,ThuT.Hypomagnesaemiainpatientswithtype2 diabetes.ClinAmSocNephrol.2007;2:366-73
6. NadlerJL,MalayanS,LuongH,ShawS,NatarajanRD,RudeRK.Intracellularfree magnesiumdeficiencyplaysakeyroleinincreased platelet reactivity in type II diabetes mellitus.Diabetes care.1992 Jul 1;15(7):835-41.
7. Graft on G, Baxter MA.The role of magnesium in diabetes mellitus: a possible mechanism for the development of diabetic complications. Journal of diabetes and its complications.1992Apr1;6(2):143-9.
8. NasriH,BaradaranHR.Lipidsinassociationwithserummagnesiumindiabetes mellituspatients.BratislLekListy.2008Jan 1;109(7):302-6.