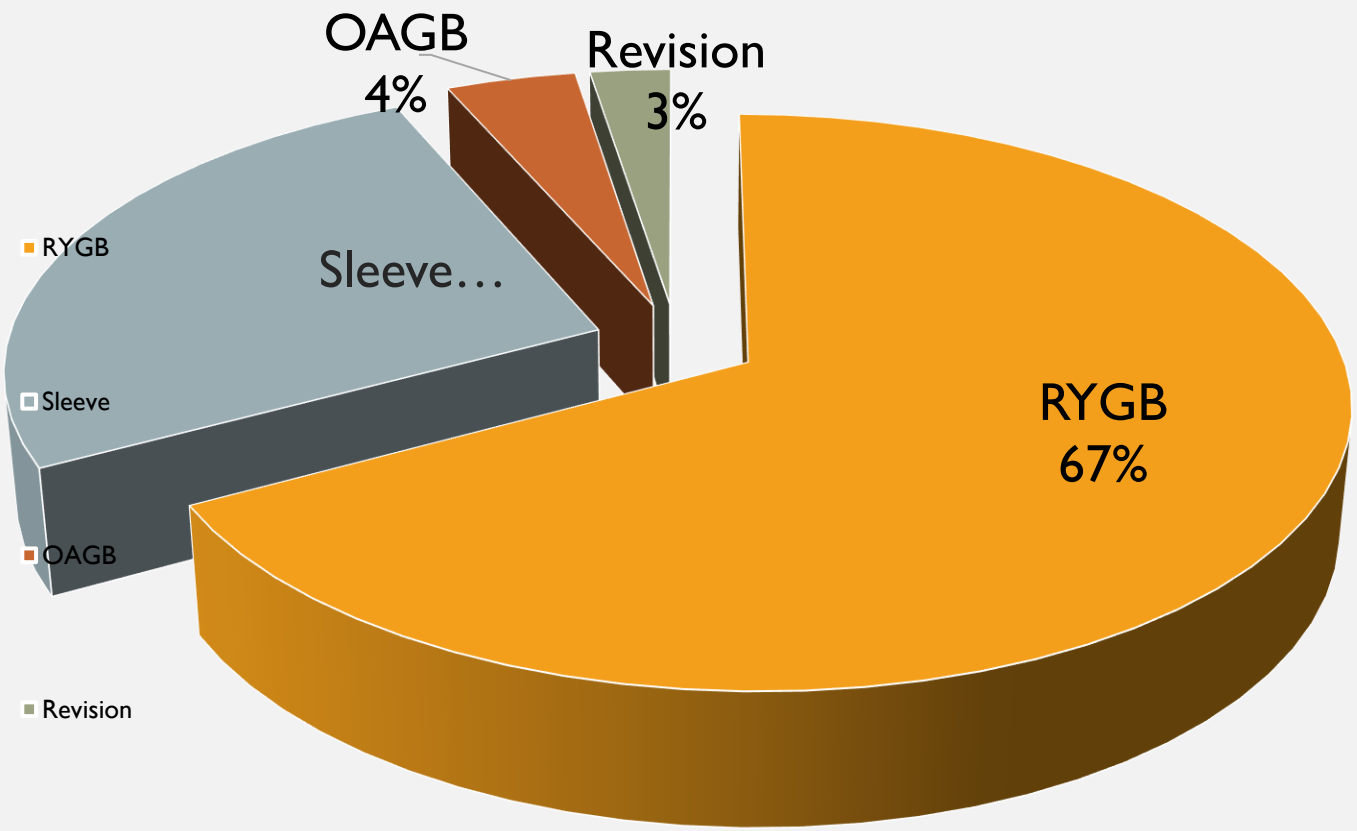
5 YEAR OUTCOMES OF SLEEVE GASTRECTOMY VS ROUX-EN-Y GASTRIC BYPASS VS ONE ANASTOMOTIC GASTRIC BYPASS IN LACTO-VEGETARIAN SUBSET OF INDIAN POPULATION.

Dr Riddhish Gadani,
Consultant Bariatric Surgeon,
Nobesity Bariatrics,
Ahmedabad,
Gujarat, India

CASE MIX



- Conflict of interest: No
- Disclosure : None

AIM OF THE STUDY

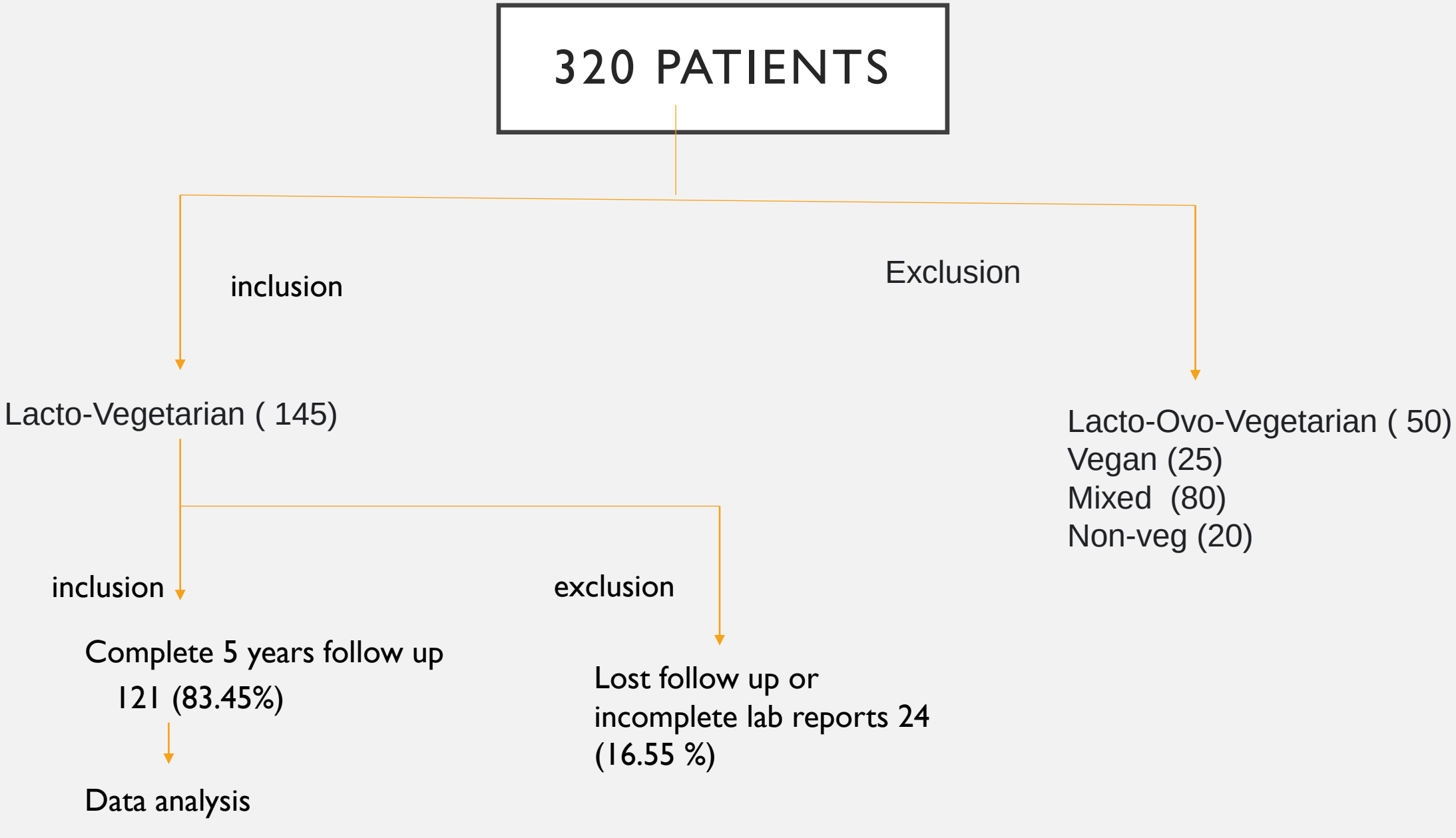
- The purpose of this retrospective analysis is to evaluate and compare the impact of bariatric surgery on weight loss, laboratory parameters, and DM remission over 5 year follow-up in Lacto-vegetarian subject in OAGB vs RYGB vs Sleeve Gastrectomy

METHOD

- 121 patients with Lacto-vegetarian lifestyle and who underwent bariatric surgery from 2015 jan to 2016 jan were retrospectively analyzed.
- The results were compared in terms of nutritional parameters, hormonal parameters, anthropometric measurements and DM remission at 1, 2, 3 and 5 years follow-up.
- During this period total 320 Patient were operated but total 121 patients met our inclusive criteria.

INCLUSIVE CRITERIA

- Age between 18 to 75
- BMI ≥32.5 with comorbidities or BMI ≥ 37.5 mg/m2
- Patient who are Lacto-Vegetarian
- Patients who has Completed 5 years follow-up


320 PATIENTS
inclusion
Exclusion
Lacto-Vegetarian (145)
Lacto-Ovo-Vegetarian (50)
Vegan (25)
Mixed (80)
Non-veg (20)
inclusion
exclusion
Complete 5 years follow up
121 (83.45%)
Lost follow up or
incomplete lab reports 24
(16.55 %)
Data analysis

SURGERY

- **Sleeve**: 36 f bogie , 5 cm away from pylorus

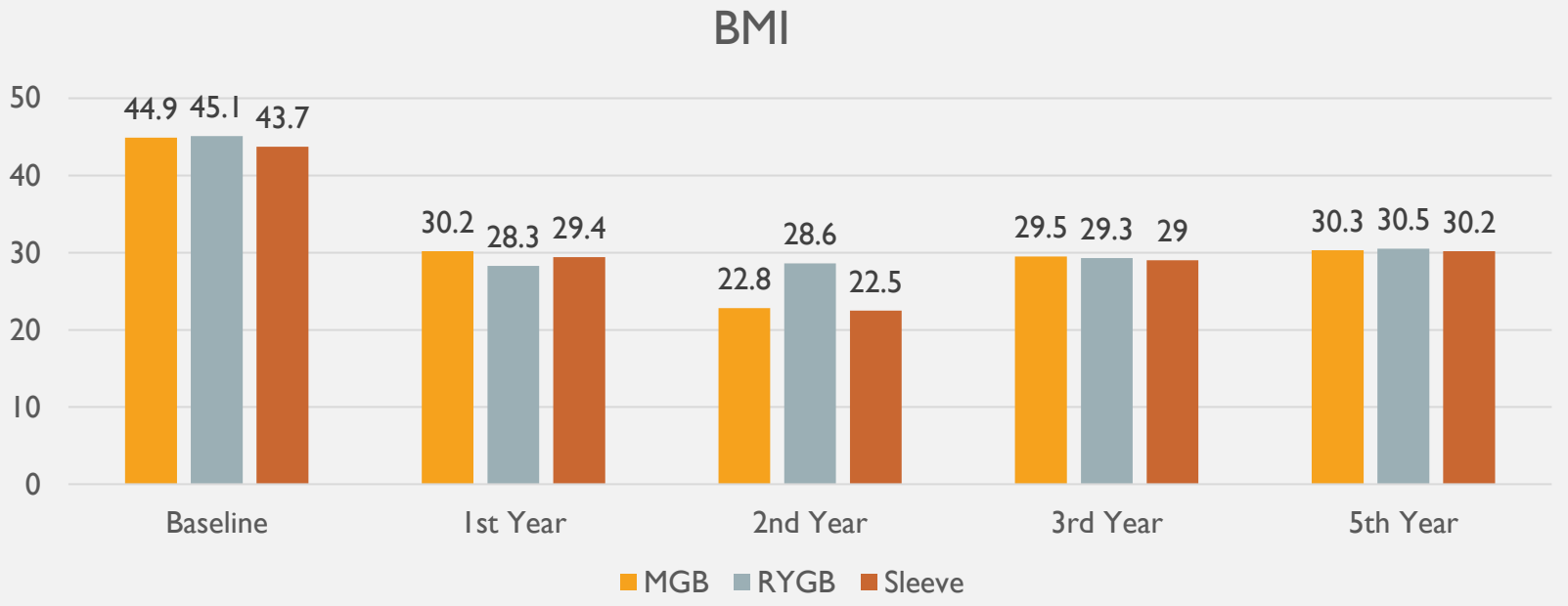
- **RYGB:** Antecolic antegastric approach, pouch size of 5 to 5. 5 cm , GCT size 36 f. BP limb length between 50 to 70 cm and Alimetry limb was 80 cm. GJ stoma size 2.7 cm using a linear stapler
- **MGB :** Limb length between 150 t0 170 cm. Standard pouch size . GJ stoma size 45 mm.

Baseline characteristics of the study population

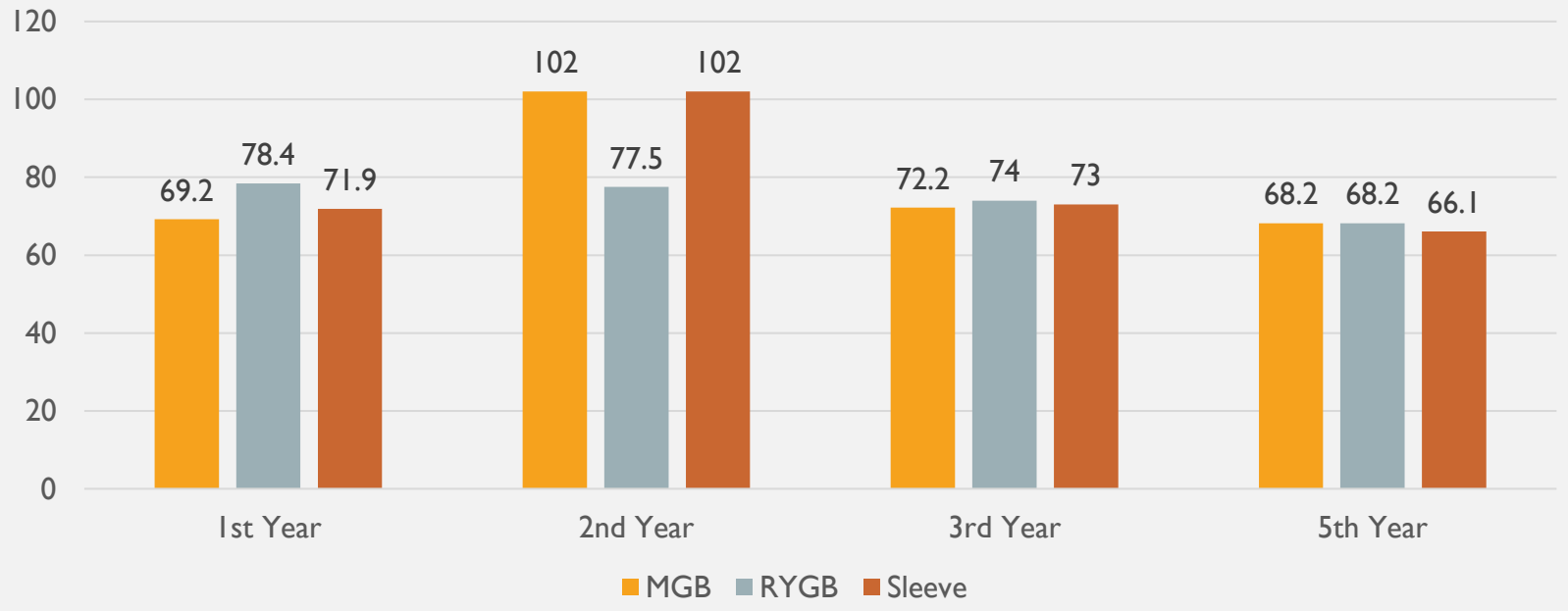
Pre-operative Characteristics	OAGB		RYGB		SLEEVE		P-Value (ANOVA)
	Mean ± SD	Min - Max	Mean ± SD	Min - Max	Mean ± SD	Min - Max	
Female, n(%)	18 (46.2%)		28 (62.2%)		27 (73%)		0.055
Age (In Yrs)	45.1 ± 12.19	20 - 67	46.1 ± 11.82	22 - 69	42.9 ± 13.38	20 - 72	0.523
Height (In cm)	164.3 ± 8.68	151 - 180	161.1 ± 8.93	144 - 177	158.4 ± 8.19	148 - 184	0.014
Weight (In kg)	121.4 ± 22.61	86.5 - 173	117 ± 25.67	81 - 220	109.9 ± 19.45	79 - 180	0.095
BMI (In kg/m^2)	44.9 ± 7.41	33.2 - 63.5	45.1 ± 9.13	30.3 - 72.1	43.7 ± 6.36	35.2 - 65.3	0.704

Pre-operative Characteristics	OAGB		RYGB		SLEEVE		P-Value (ANOVA)
	Mean ± SD	Min - Max	Mean ± SD	Min - Max	Mean ± SD	Min - Max	
DM, n(%)	22 (56.4%)		20 (44.4%)		13 (35.1%)		0.067
Albumin	4 ± 0.33	2.9 - 4.5	3.9 ± 0.31	3.3 - 4.8	3.9 ± 0.35	3.1 - 4.9	0.271
TSH	2.6 ± 2.08	0.2 - 12.3	3.1 ± 1.87	1 - 9.1	3.2 ± 3.25	0.3 - 16.1	0.515
B12	347.4 ± 244.39	86 - 1057	324.1 ± 292.8	93 - 2000	419.8 ± 357.54	134 - 2000	0.34
Iron	60.9 ± 24.6	22.7 - 129	65.2 ± 24.76	16.8 - 127.9	74 ± 36.46	17.6 - 190.8	0.136
D3	15.5 ± 10.86	4.2 - 63.8	17.2 ± 14.21	3.7 - 70.6	16.9 ± 9.62	4.9 - 44.7	0.798
HbA1c	7.1 ± 1.98	4.2 - 12.4	7.1 ± 1.83	4.8 - 12.5	6.2 ± 1.14	4.9 - 9.5	0.029
HB	12.5 ± 1.72	8.1 - 16	12.4 ± 1.71	8.8 - 16.7	12.4 ± 1.56	9.5 - 16.8	0.884

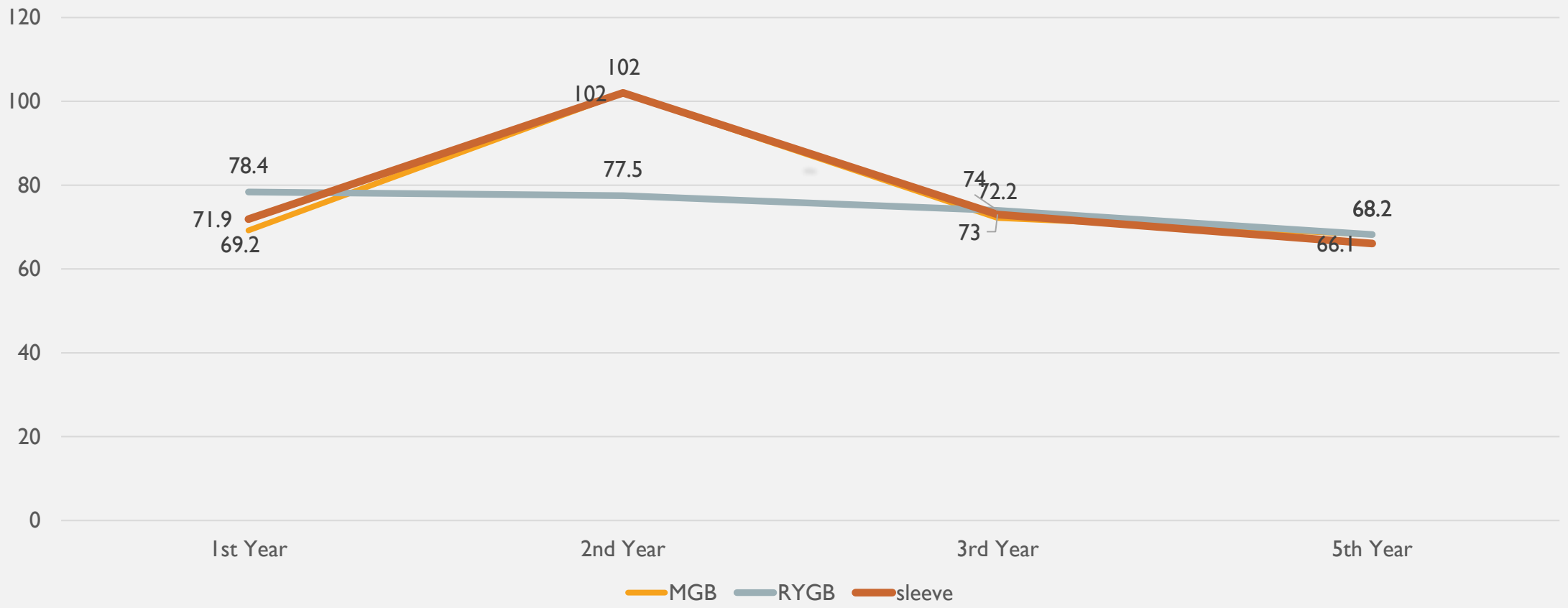
Result


BMI
50
40
30
20
10
0
44.9
45.1
43.7
30.2
28.3
29.4
22.8
28.6
22.5
29.5
29.3
29
30.3
30.5
30.2
Baseline
1st Year
2nd Year
3rd Year
5th Year
MGB
RYGB
Sleeve

% EXCESS WEIGHT LOSS



Percentage weight loss



- The weight loss and BMI loss at year 1 for RYGB patients were higher as compared to MGB and SG patients but not statistically significant ($p>0.05$), but significantly higher in case of % EWL Loss ($p<0.05$).
- **At year 2, the weight loss, BMI loss, and %EWL was significantly higher among MGB and Sleeve group as compared to RYGB ($p<0.05$).**
- **At 3 and 5 year, there were no significant difference of weight, weight loss, BMI, %BMI loss OR %EWL among MGB, RYGB, and SG.**

Others Report

- Yong Zhang et all, At 5 years, %EWL for LSG and LRYGB was 63.2±24.5 % and 76.2±21.7 % (P=0.02) . (our study showed 66% and 68 % EWL After 5 years)
- Jaime Ruiz-Tovar et all %EWL 5 years follow up was 76.3 ± 6, 77.1 ± 6.1 and 97.9 ± 7%, For Sleeve, RYGB and OAGB respectively.

OBES SURG
DOI 10.1007/s11695-014-1220-3

ORIGINAL CONTRIBUTIONS

A 6-Year Experience with 1,054 Mini-Gastric Bypasses—First Study from Indian Subcontinent

K. S. Kular · N. Manchanda · R. Rutledge

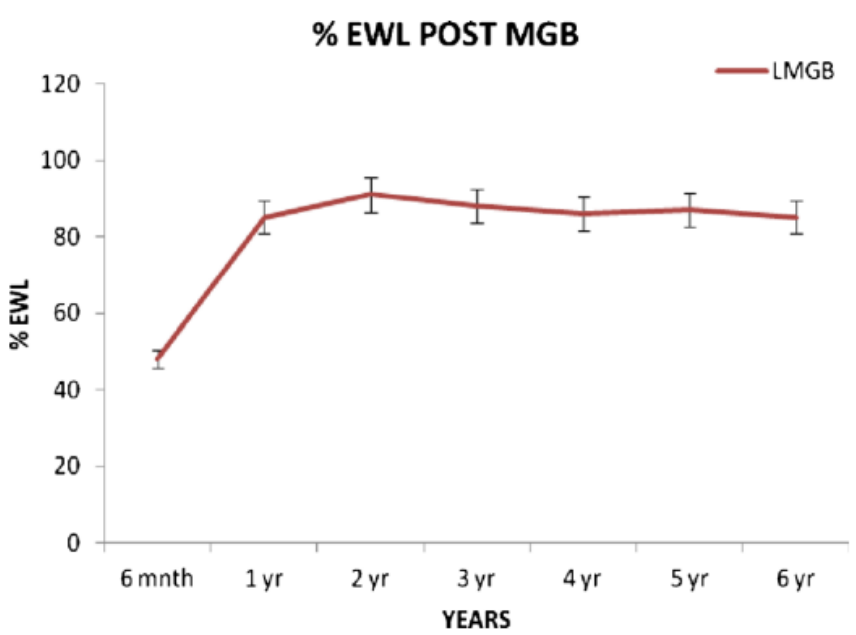


Fig. 2 Percentage excess weight loss (% EWL) following the LMGB

DIABETES MELLITUS

Prevalence of DM	MGB (n=39)	RYGB (n=45)	LSG (n=37)
Baseline	56.4%	44.4%	35.1%
1st Year	5.1%	0%	18.9%
2nd Year	2.6%	0%	16.2%
3rd Year	5.1%	4.4%	8.1%
5th Year	12.8%	13.3%	13.5%

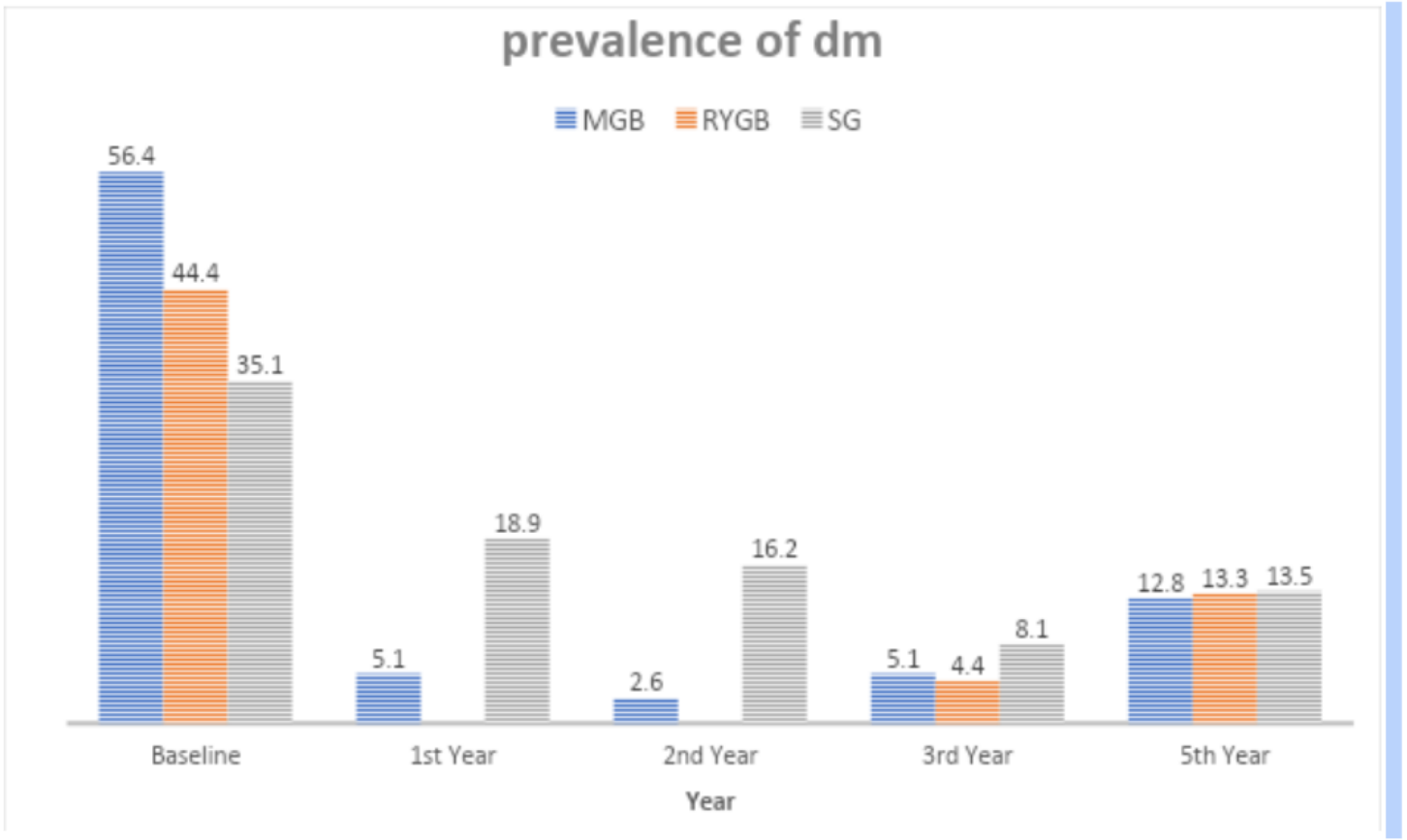
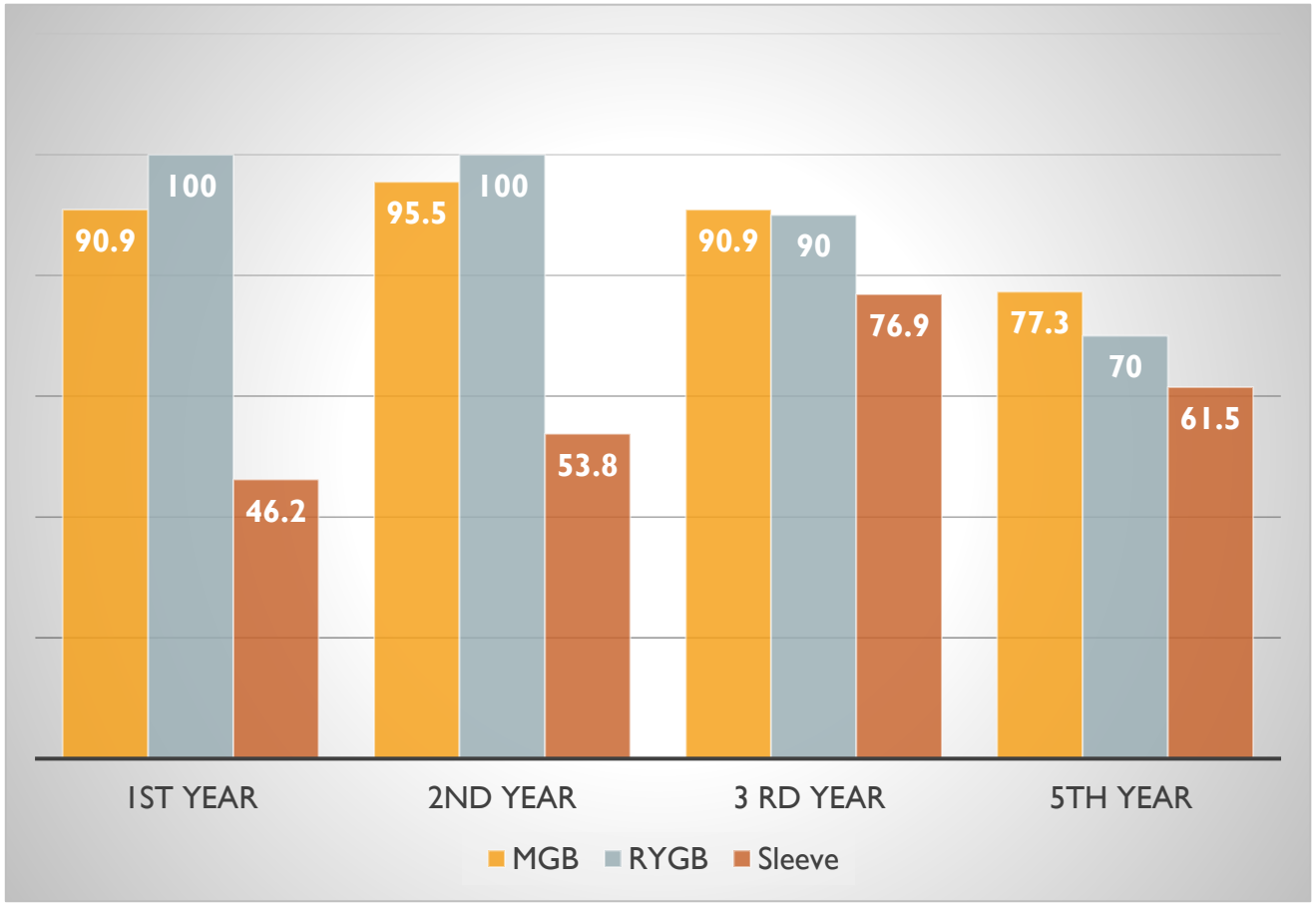
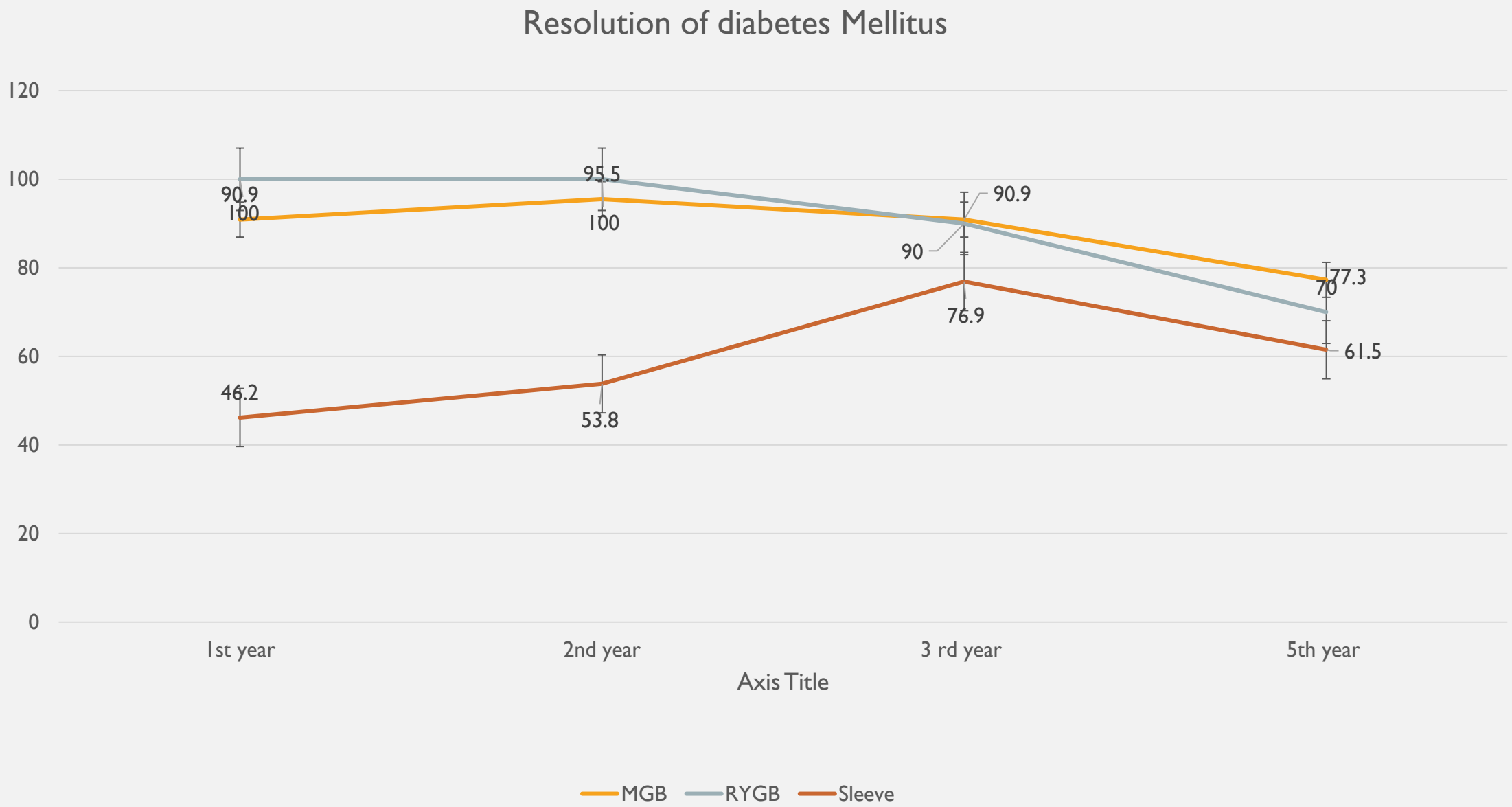


Fig 6 : Prevalence of Diabetic Mellitus

- Resolution of diabetes Mellitus




Resolution of diabetes Mellitus
120
100
80
60
40
20
0
90.9
100
95.5
100
90
90.9
70
77.3
76.9
46.2
53.8
61.5
1st year
2nd year
3 rd year
5th year
Axis Title
MGB
RYGB
Sleeve

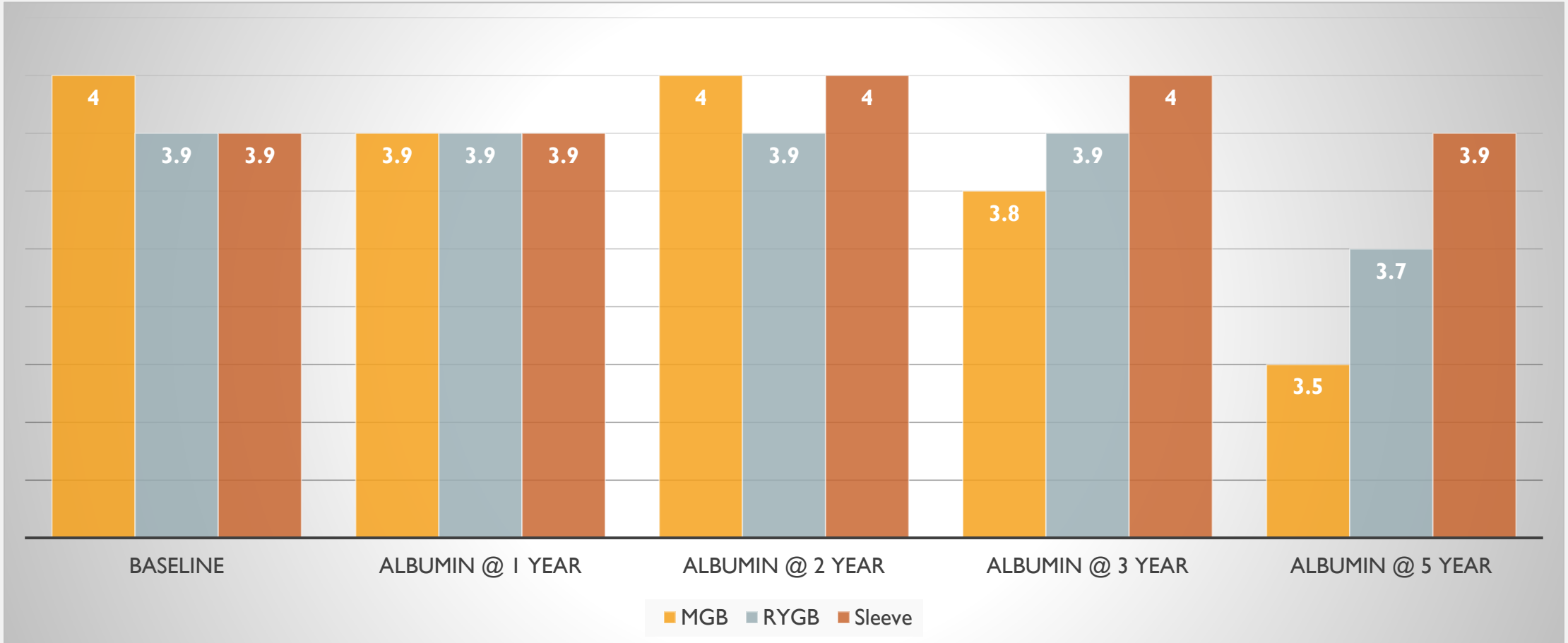
COMPARE WITH OTHER STUDIES

- Lene R. Madsen …. **65**% of the RYGB cohort fulfilled criteria of remission in first year, increasing to 74% at 6–12 months and surpassing 70% in first 5 years (**our 5 years remission of DM is 70 %)**
- Jiime et all One year after surgery, remission rate of DM after SG was 41.4%, RYGB 79.7% and OAGB 100%. Five years after surgery, remission rate after SG was 28.6%, after RYGB 71% and after OAGB 100%

Serum Albumin

Clinical Parameters	MGB (n=39)		RYGB (n=45)		SG (n=37)		P-Value (ANOVA)
	Mean ± SD	Min - Max	Mean ± SD	Min - Max	Mean ± SD	Min - Max	
Albumin @ 1 Year	3.9 ± 0.3	2.9 - 4.3	3.9 ± 0.31	3.3 - 4.8	3.9 ± 0.23	3.5 - 4.4	0.348
Albumin @ 2 Year	4 ± 0.24	3.3 - 4.3	3.9 ± 0.36	3.2 - 4.9	4 ± 0.19	3.6 - 4.5	0.386
Albumin @ 3 Year	3.8 ± 0.2	3.5 - 4.6	3.9 ± 0.27	3.1 - 4.8	4 ± 0.17	3.5 - 4.3	0.285
Albumin @ 5 Year	3.6 ± 0.32	2.7 - 4.4	3.8 ± 0.33	3.7 - 4.7	3.9 ± 0.26	3.4 - 4.5	0.985

ALBUMIN LEVEL

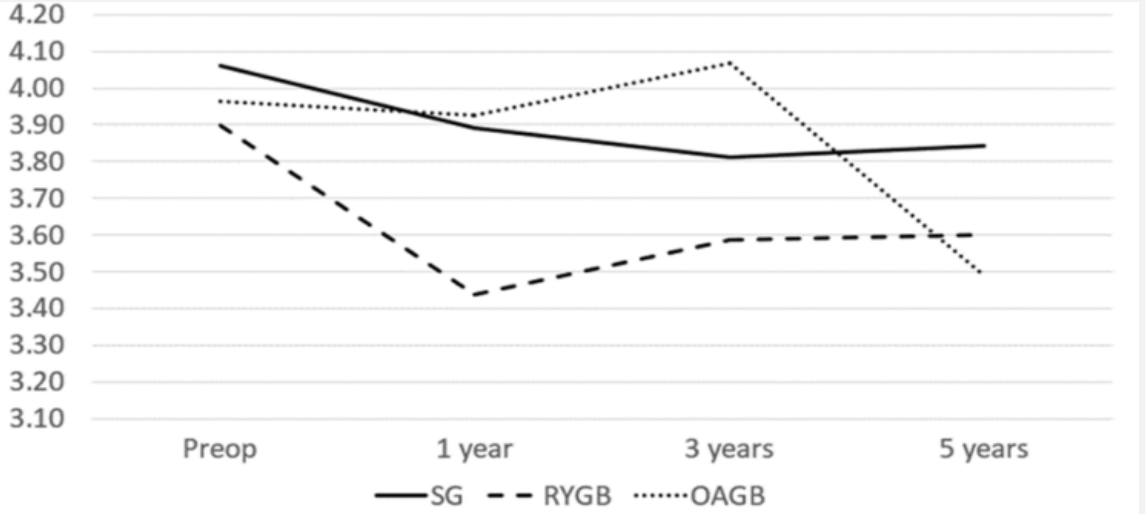


Serum Albumin

Original Contributions | Published: 07 February 2019

Weight Regain After Bariatric Surgery—A Multicentre Study of 9617 Patients from Indian Bariatric Surgery Outcome Reporting Group

Sarfaraz J. Baig, Pallawi Priya ✉, Kamal K. Mahawar & Sumeet Shah for the Indian Bariatric Surgery Outcome Reporting (IBSOR) Group

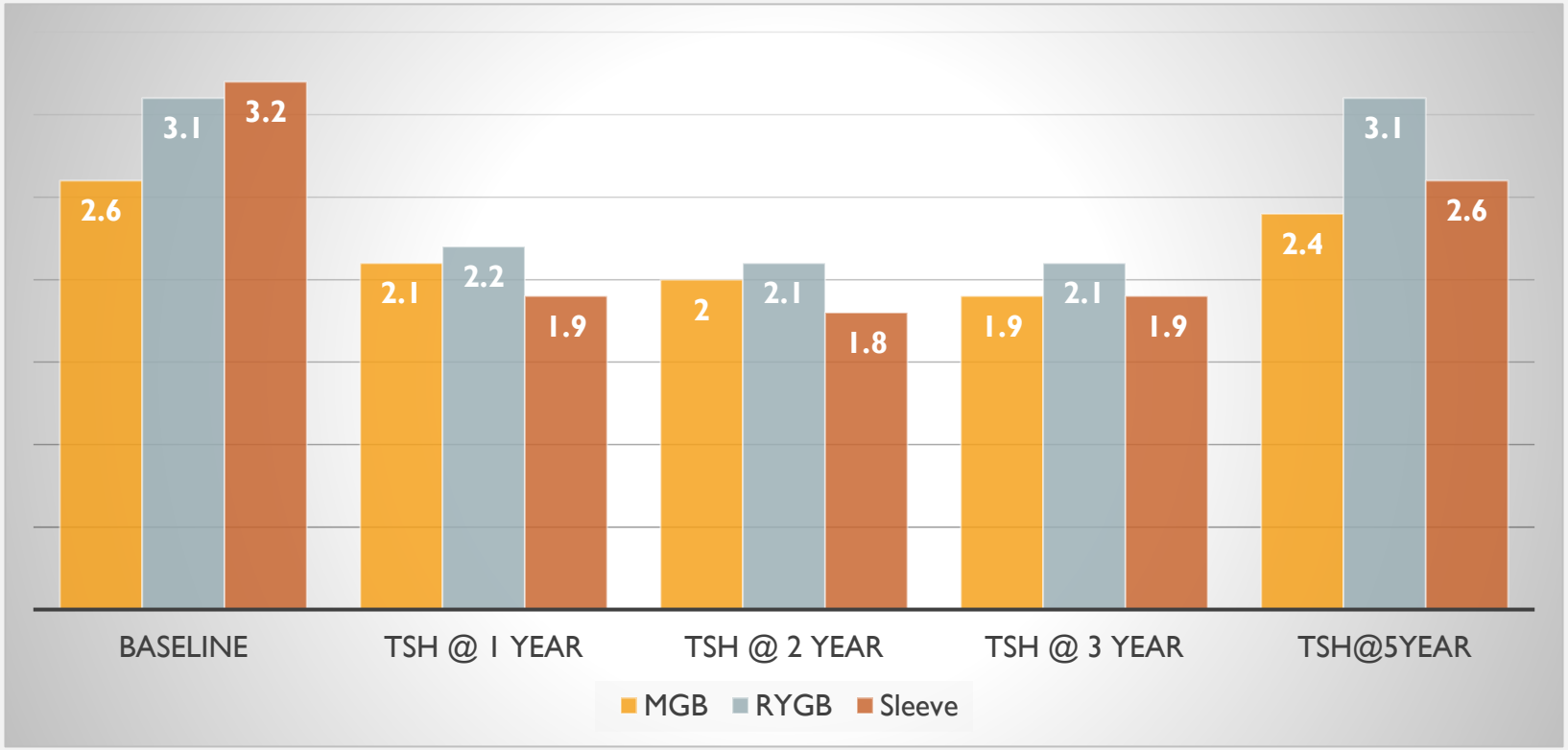


	Preop	1 year	3 years	5 years
SG (mean +/- SD)	4.06 +/- 0.49	3.89 +/- 0.54	3.81 +/- 0.55	3.84 +/- 0.54
RYGB (mean +/- SD)	3.90 +/- 0.43	3.44 +/- 0.50	3.59 +/- 0.45	3.60 +/- 0.45
OAGB (mean +/- SD)	3.96 +/- 0.45	3.93 +/- 0.46	4.07 +/- 0.64	3.49 +/- 0.36

TSH level

Clinical Parameters	MGB (n=39)		RYGB (n=45)		SG (n=37)		P-Value (ANOVA)
	Mean SD	min-max	Mean SD	min-max	Mean SD	Min-max	
TSH @ 1 Year	2.1 ± 0.92	0.7 - 4.2	2.2 ± 0.85	1 - 4.3	1.9 ± 0.81	0.3 - 4	0.245
TSH @ 2 Year	2 ± 0.73	0.8 - 3.7	2.1 ± 0.81	0.9 - 4.3	1.8 ± 0.79	0.2 - 3.8	0.395
TSH @ 3 Year	1.9 ± 0.8	0.9 - 4.7	2.1 ± 0.83	0.9 - 4.3	1.9 ± 0.9	0.7 - 5	0.555
TSH @ 5 Year	2.4 ± 1.68	0.8 - 9.9	3.1 ± 3.37	0.6 - 18.8	2.6 ± 2.14	0.4 - 10.6	0.44

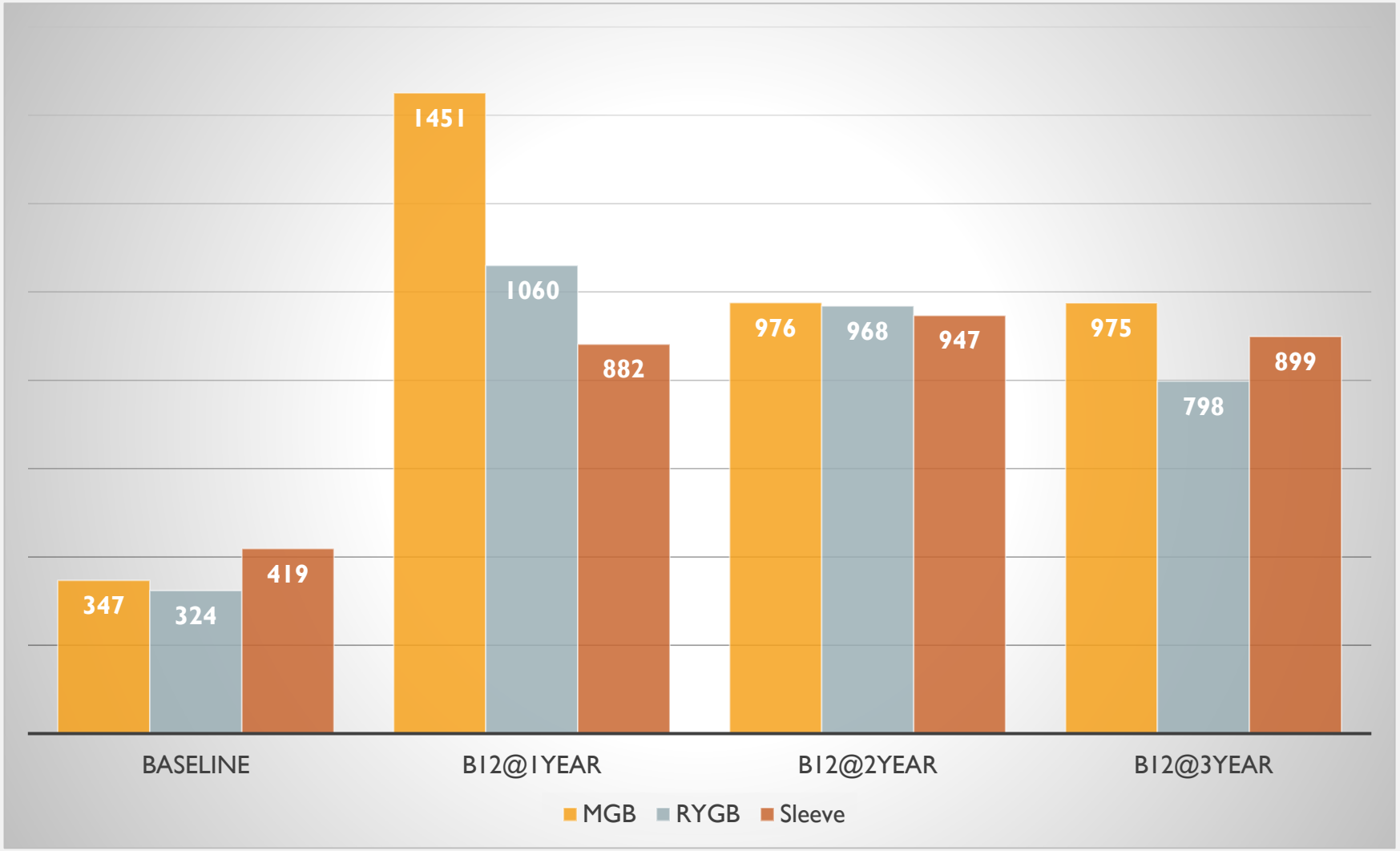
TSH


2.6
3.1
3.2
2.1
2.2
1.9
2
2.1
1.8
1.9
2.1
1.9
2.4
3.1
2.6
BASELINE
TSH @ 1 YEAR
TSH @ 2 YEAR
TSH @ 3 YEAR
TSH@5YEAR
MGB
RYGB
Sleeve

B12

Clinical Parameters	MGB (n=39)		RYGB (n=45)		SG (n=37)		P-Value (ANOVA)
	Mean SD	min-max	Mean SD	min-max	Mean SD	Min-max	
B12 @ 1 Year	**1451.8 ± 1509.5**	**286 - 10050**	**1060.6 ± 1229.84**	**200 - 8767**	**882.7 ± 382.77**	**230 - 2000**	**0.093**
B12 @ 2 Year	**976.3 ± 443.51**	**155 - 1870**	**968.2 ± 1276.36**	**240 - 8987**	**947.2 ± 390.43**	**340 - 2000**	**0.988**
B12 @ 3 Year	**975.4 ± 355.11**	**223 - 2000**	**798.7 ± 353.17**	**130 - 1876**	**899.4 ± 410.93**	**230 - 2000**	**0.097**
B12@ 5 Year	**628 ± 457.55**	**140 - 2000**	**512.7 ± 425.46**	**124 - 1953**	**575.6 ± 463.07**	**50 - 2000**	**0.499**

B12



Pre OP , Post OP (Significant)

VITAMIN B12

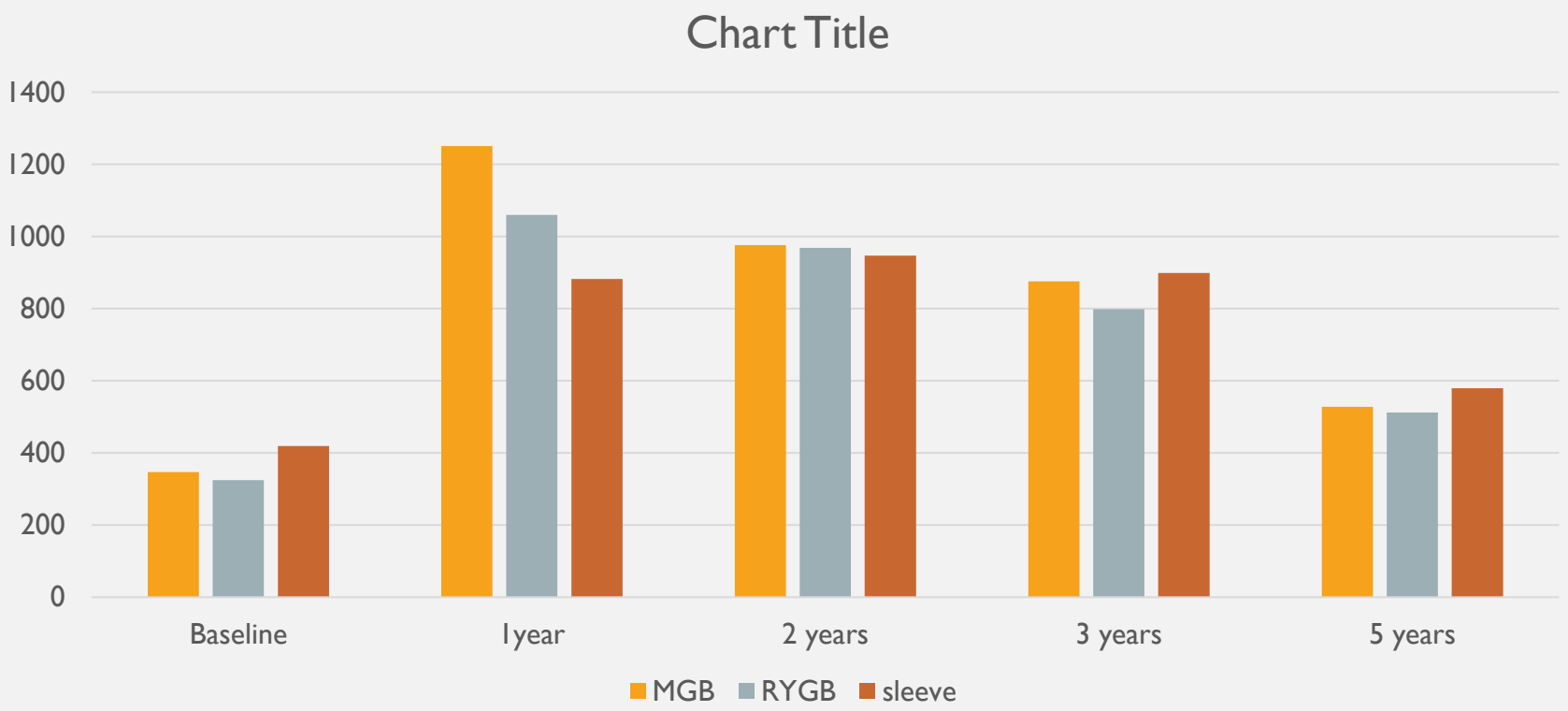


Chart Title
1400
1200
1000
800
600
400
200
0
Baseline
1year
2 years
3 years
5 years
MGB
RYGB
sleeve

Serum Iron

Clinical Parameters	MGB (n=39)		RYGB (n=45)		SG (n=37)		P-Value (ANOVA)V
	Mean SD	min-max	Mean SD	min-max	Mean SD	Min-max	
Iron @ 1 Year	**84.6 ± 28.47**	**16 - 145**	**73.2 ± 21.08**	**30 - 125**	**86.5 ± 26.17**	**32 - 139**	**0.036**
Iron @ 2 Year	**83.4 ± 20.34**	**30 - 156**	**83.2 ± 24.51**	**25 - 167**	**93.1 ± 23.81**	**55 - 187**	**0.103**
Iron @ 3 Year	**84.1 ± 23.01**	**40.1 - 156**	**79.5 ± 26.56**	**38.5 - 145**	**82.6 ± 18.26**	**30 - 123**	**0.645**
Iron @ 5 Year	**87.9 ± 28.91**	**28 - 176**	**80.8 ± 30.78**	**17 - 159**	**98.5 ± 34.4**	**34.1 - 165.3**	**0.043**

SERUM IRON

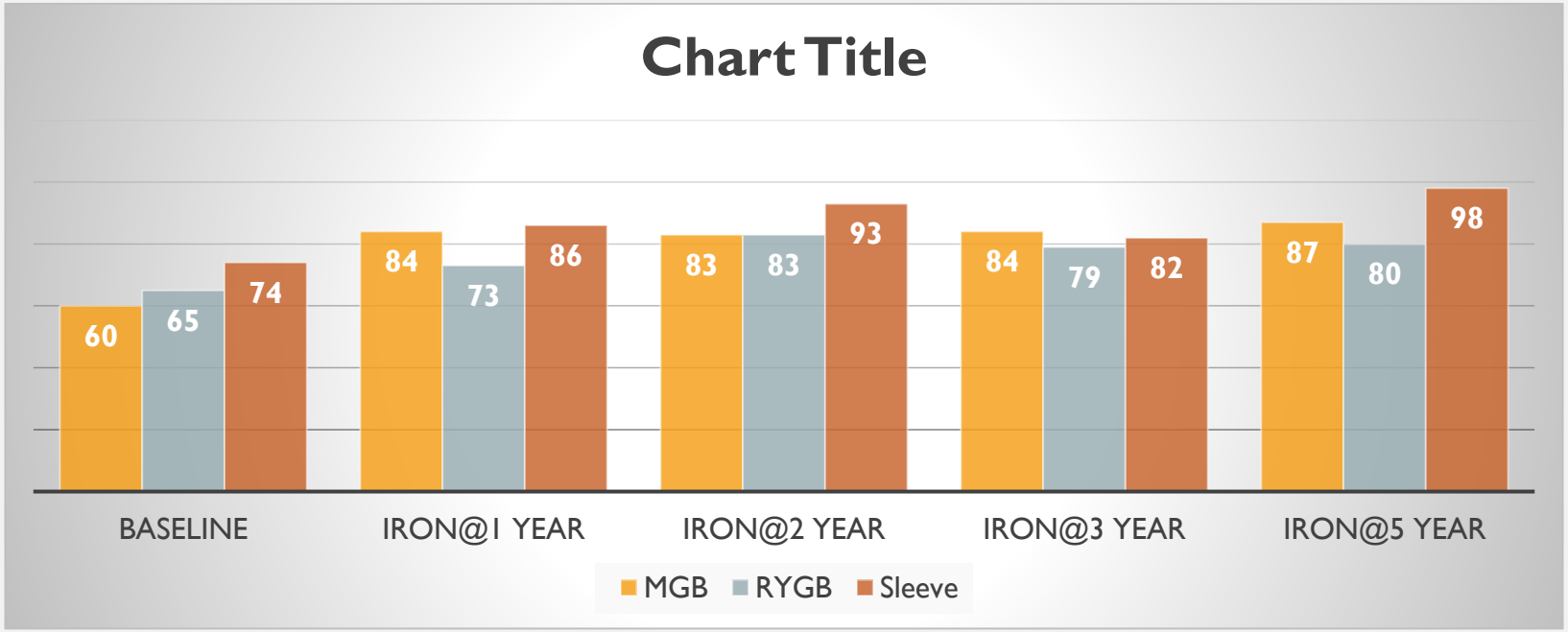
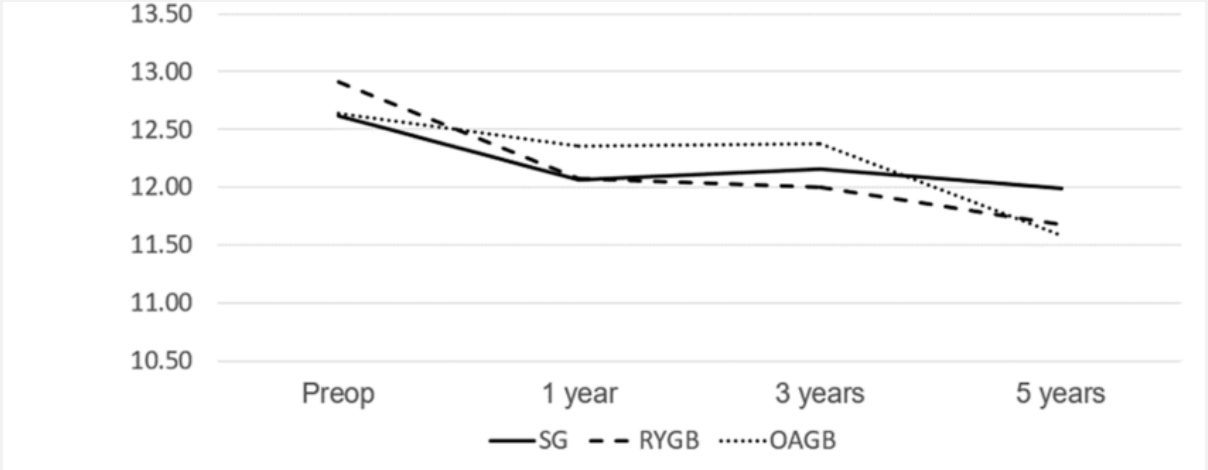


Chart Title
60
65
74
84
73
86
83
83
93
84
79
82
87
80
98
BASELINE
IRON@1 YEAR
IRON@2 YEAR
IRON@3 YEAR
IRON@5 YEAR
MGB
RYGB
Sleeve

Hemoglobin

Clinical Parameters	MGB (n=39)		RYGB (n=45)		SG (n=37)		P-Value (ANOVA)V
	Mean SD	min-max	Mean SD	min-max	Mean SD	Min-max	
Hb @ 1 Year	**12.5 ± 1.26**	**10.2 - 15.1**	**12.4 ± 1.09**	**9.1 - 15**	**12.5 ± 0.98**	**10.3 - 15**	**0.372**
Hb @ 2 Year	**12.5 ± 1.17**	**10.2 - 15.1**	**12.6 ± 1.26**	**10.4 - 15.3**	**12.6 ± 1.94**	**2.3 - 15**	**0.761**
Hb @ 3 Year	**12.3 ± 1.93**	**3.1 - 15**	**12 ± 1.38**	**10 - 15**	**12.9 ± 0.81**	**11.5 - 14.3**	**0.975**
Hb @ 1 Year	**12.8 ± 1.98**	**4.6 - 16.4**	**12.1 ± 1.94**	**7.4 - 16**	**12.7 ± 1.48**	**9.8 - 16.7**	**0.02**

Haemoglobin



	Preop	1 year	3 years	5 years
SG (mean +/- SD)	12.62 +/- 1.62	12.06 +/- 1.59	12.15 +/- 1.56	11.99 +/- 1.47
RYGB (mean +/- SD)	12.91 +/- 1.48	12.08 +/- 1.43	12.01 +/- 1.35	11.68 +/- 1.38
OAGB (mean +/- SD)	12.64 +/- 1.62	12.36 +/- 1.70	12.38 +/- 1.94	11.58 +/- 1.48

Original Contributions | Published: 07 February 2019

Weight Regain After Bariatric Surgery—A Multicentre Study of 9617 Patients from Indian Bariatric Surgery Outcome Reporting Group

Sarfaraz J. Baig, Pallawi Priya ✉, Kamal K. Mahawar & Sumeet Shah for the Indian Bariatric Surgery Outcome Reporting (IBSOR) Group

SERUM IRON

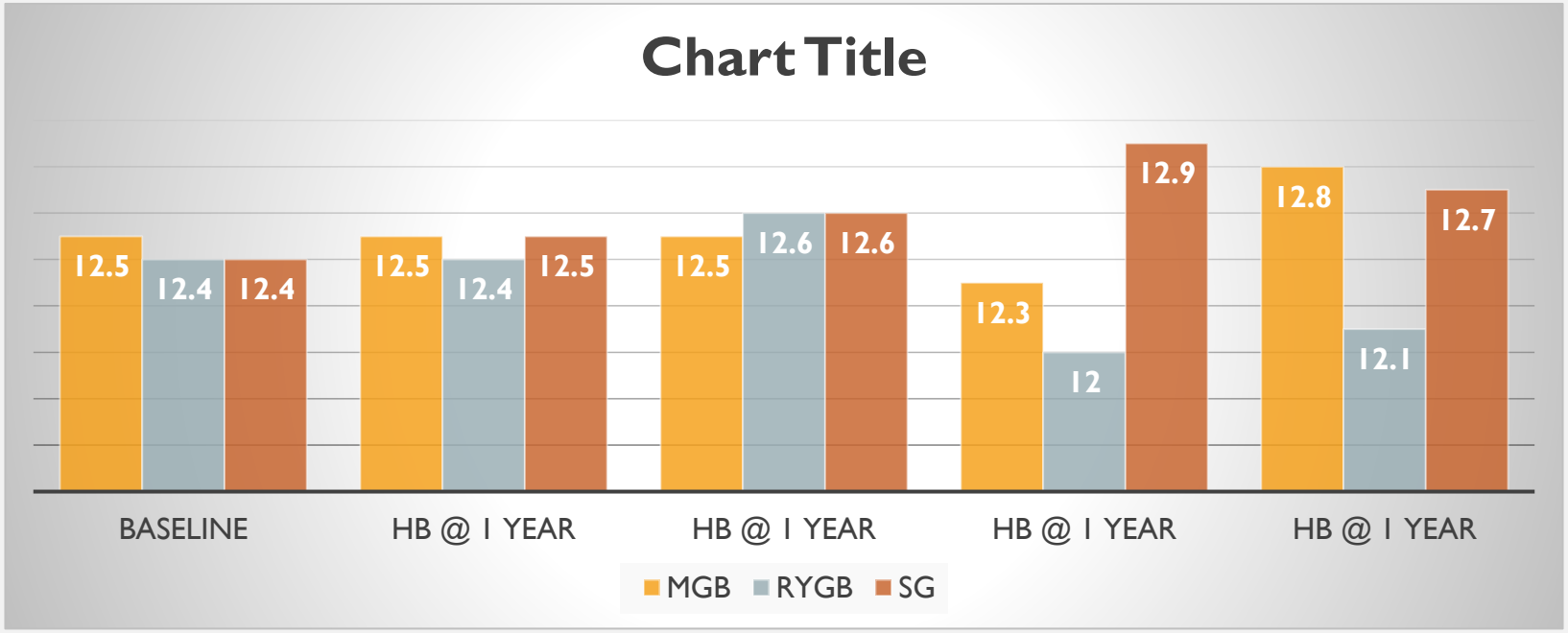
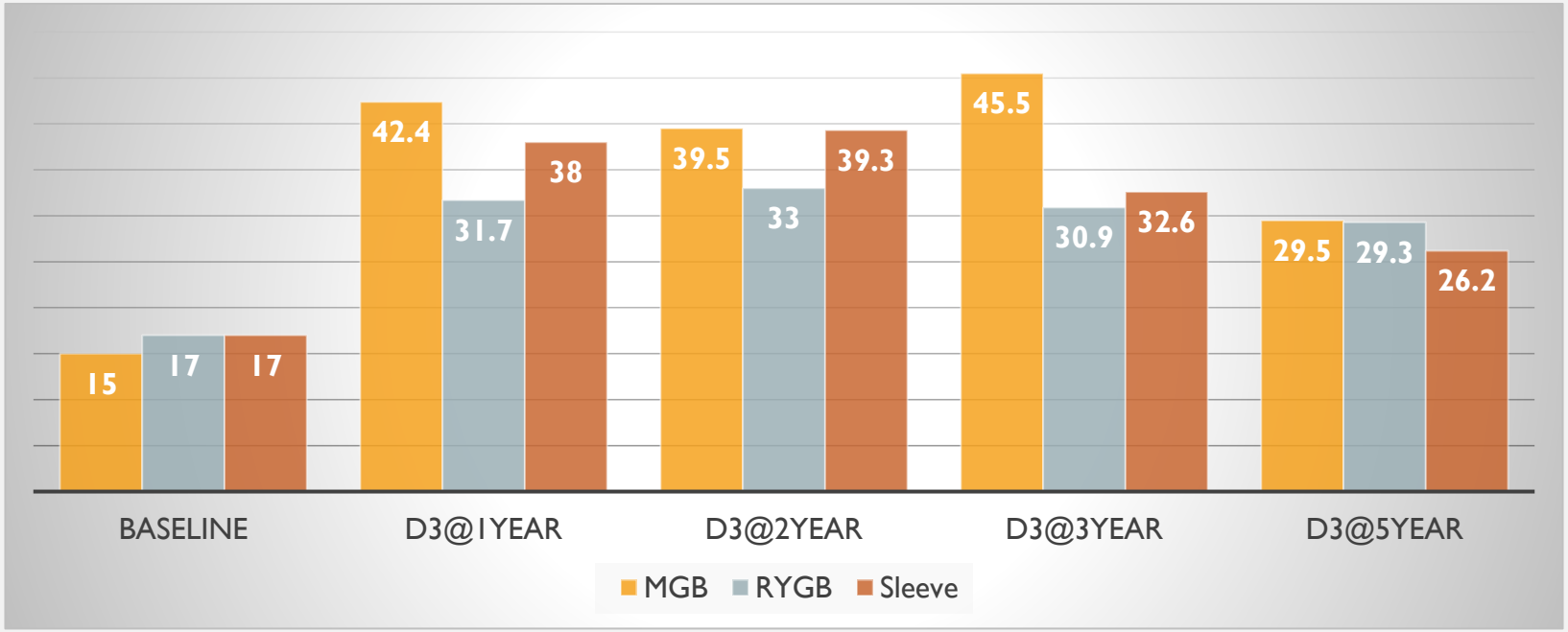


Chart Title
12.5
12.4
12.4
12.5
12.4
12.5
12.5
12.6
12.6
12.3
12
12.9
12.8
12.1
12.7
BASELINE
HB @ 1 YEAR
HB @ 1 YEAR
HB @ 1 YEAR
HB @ 1 YEAR
MGB
RYGB
SG

Vit D3

Clinical Parameters	MGB (n=39)		RYGB (n=45)		SG (n=37)		P-Value (ANOVA)V
	Mean SD	min-max	Mean SD	min-max	Mean SD	Min-max	
Vit D3 @ 1 Year	42.4 ± 17.79	7 - 78	31.7 ± 12.53	17.6 - 87	38 ± 13.35	20.2 - 76	**0.005**
Vit D3 @ 2 Year	39.5 ± 16.84	12 - 78	33 ± 9.59	19 - 65	39.3 ± 10.87	23 - 75	0.029
Vit D3 @ 3 Year	45.5 ± 16.95	12 - 76	30.9 ± 11.84	11.2 - 65	32.6 ± 11.57	13 - 80	**<0.001**
Vit D3 @ 1 Year	29.5 ± 12.16	5.5 - 60.5	29.3 ± 18.63	3.3 - 89	26.2 ± 15.55	6.7 - 66	0.585

SERUM D3


15
17
17
42.4
31.7
38
39.5
33
39.3
45.5
30.9
32.6
29.5
29.3
26.2
BASELINE
D3@1YEAR
D3@2YEAR
D3@3YEAR
D3@5YEAR
MGB
RYGB
Sleeve

Conclusion

- ✓% EWL was almost similar in RYGB, MGB and SG in 5 years follow-up.(68 %- 68% and 66%)

- ✓DM remission showed significant improvement in MGB and RYGB at years 1,2,3 and 5 whereas for SG DM remission was significant at 3rd year only.

- ✓There was no severe hypoalbuminemia in lacto-vegetarian group in MGB , RYGB and SG group even after 5 years of follow up .
- ✓Iron,Hb and B12 were not decreased after 5 years follow up in any groups.
- ✓Level of TSH level were similar in all groups.
- ✓MGB , RYGB and Sleeve are safe surgery in every lacto-vegetarian patient but they need prompt follow up.

FINAL TAKE

All surgeries behave in similar manner in long term.

No surgery is a bad surgery, patient selection is very important in deciding the type of surgery.

LIMITATION

- Small sample size
- Single centre study
- Not compared with other subsets(mixed or nonveg subset)

THANK YOU