ANEMIA, DIABETES AND LOW FUNCTIONAL CONDITION AS INDEPENDENT FACTORS FOR POOR CLINICAL OUTCOME IN TOTAL KNEE ARTRHOPLASTY

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Background

Health status in general and in particular before and after Total Knee Arthroplasty (TKA) depends on multiple factors. Several have been associated with reduced functional outcomes following TKA.

Preoperative anemia has been associated with high morbidity and complications after TKA, nevertheless, controversy exists on if it has an influence in clinical outcomes and influence on mid or long-term outcome following TKA is unknown.

Diabetes has a high incidence in patients undergoing TKA. Several studies show that quality of life in diabetic patients is decreased compared to non-diabetic.

Patient related outcome scales are highly predictive of patient reports treatment success following joint arthroplasty, but there are no gold standards in terms of TKA outcomes tools
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Controversy exists over which and how the different factors may influence health status after TKA in short-term follow-up; but so far, there are no mid or long-term studies on how these factors may affect TKA result

Material & Methods

This is a follow-up retrospective, observational study on the impact that factors as: age, gender, body mass index (BMI), American Society of Anesthesiologist score (ASA), Charlson score, hemoglobin (Hb) and glycaemia (Gly) blood levels before and after TKA and WOMAC and KSS scores before TKA; may have on the mid-term WOMAC and KSS follow-up.

We studied 595 records of TKA for primary. Second TKA procedure and patients with severe poly articular or psychiatric disease or major illness (i.e. advanced cancer) were excluded. A total of 503 patients and TKA were studied.

Demographics	
Gender	
Females	73.2%
Males	26.8%
Age	73.3+-1
BMI	31.2+-0.6
ASA	
Normal-Mild	68.8%
Severe	31.2%
Charlson	
<= 2	80.8%
> 2	19.2%
Anemia (WHO)	
Normal	85%
Mild	12.6%
Moderate	2.4%
Gly pre (ADA)	
Normal	83.8%
Bad control	16.2%
Infection	1.4%
Complications	4.2%

We utilized the World Health Organization (WHO)'s gender based definition for anemia severity. The same written protocol with subcutaneous insulin under demand was used for preoperative and postoperative glycemic control in all patients with high blood glycemic levels or diabetes.

Independent variables were WOMAC-FF and KSS-FF stratified in good or bad result; and the dependent variables were the Hb-before, Hb-24h, Gly-before, Gly-24h, KSS before and WOMAC before.

Results

KSS Excellent-Good (≥ 160) and Poor-Bad (<160)

n=503		Median	P
Age	Excellent-Good	74.6 (49.3-91.4)	0.646
	Poor-Bad	74.2 (45.2-91.5)	
BMI	Excellent-Good	30.9 (18.2-47.1)	0.554
	Poor-Bad	31.2 (22-46-4)	
Hb pre	Excellent-Good	13.5 (10-17)	**0.039***
	Poor-Bad	13.2 (10.2-16.8)	
Hb24h post	Excellent-Good	9.8 (5.4-14.3)	0.081
	Poor-Bad	9.5 (6.8-14.3)	
Glypre	Excellent-Good	99.0 (21-272)	**0.048***
	Poor-Bad	103.0 (74-245)	
Gly24h post	Excellent-Good	126.5 (81-345)	0.872
	Poor-Bad	126.0 (85-383)	
KSS pre	Excellent-Good	84.0 (8-127)	0.069
	Poor-Bad	75.0 (7-149)	
WOMAC pre	Excellent-Good	52.0 (7-95)	**0.049***
	Poor-Bad	57.0 (8-91)	
WOMAC post	Excellent-Good	9.0 (0-70)	0.000
	Poor-Bad	13.0 (0-89)	
Follow-up	Excellent-Good	3.0 (1-6)	0.976
	Poor-Bad	3.0 (1-6)	

Low preoperative Hb levels (P <0.039), High preoperative Gly levels (P <0.048) and a preoperative KSS with low score (P <0.0049) are associated with poorer results of postoperative KSS.

WOMAC Excellent-Good (≥ 22) and Poor-Bad (<22)

n=503		Median	P
Age	Excellent-Good	74.6 (45.2-91.5)	0.342
	Poor-Bad	75.8 (62-87.5)	
BMI	Excellent-Good	31.1 (18.2-47.1)	0.160
	Poor-Bad	30.1 (24.3-39.1)	
Hb pre	Excellent-Good	13.4 (10-17)	0.432
	Poor-Bad	13.4 (11.2-15.3)	
Hb24h post	Excellent-Good	9.7 (5.4-14.3)	0.256
	Poor-Bad	9.4 (7.4 -11.7)	
Gly pre	Excellent-Good	99 (21-272)	**0.017***
	Poor-Bad	110.0 (84-245)	
Gly24h post	Excellent-Good	126.5 (81-383)	0.159
	Poor-Bad	125.0 (93-345)	
KSS pre	Excellent-Good	83.5 (8-164)	**0.008***
	Poor-Bad	69.5 (7-111)	
KSS Post	Excellent-Good	173.0 (90-200)	**0.000****
	Poor-Bad	152.0 (14-190)	
WOMAC pre	Excellent-Good	54.0 (7-95)	**0.005***
	Poor-Bad	60.0 (45-91)	
Follow-up	Excellent-Good	3.0 (1-6)	0.371
	Poor-Bad	3.0 (2-6)	

High levels of preoperative glycemia (P <0.017), low values of preoperative KSS (P <0.008), and high preoperative WOMAC score (P <0.005) are related to worse postoperative WOMAC results.

Conclusion

Preoperative low hemoglobin levels, preoperative and postoperative higher glycaemia levels and preoperative lower KSS and higher WOMAC scores are independently associated with poor-bad short-term KSS and WOMAC outcomes after TKA.

We believe that this information is important when it comes to providing an initial prognosis to patients and taking corrective measures prior to surgery.

Good assessment and optimization of these variables may help in improving results in TKA.

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