



HYPOTHESIS:

Exercise performance is dependent on glucose supply as fuel to working muscles.

We hypothesized that postprandial insulin secretion impacts exercise induced glucose and insulin response.

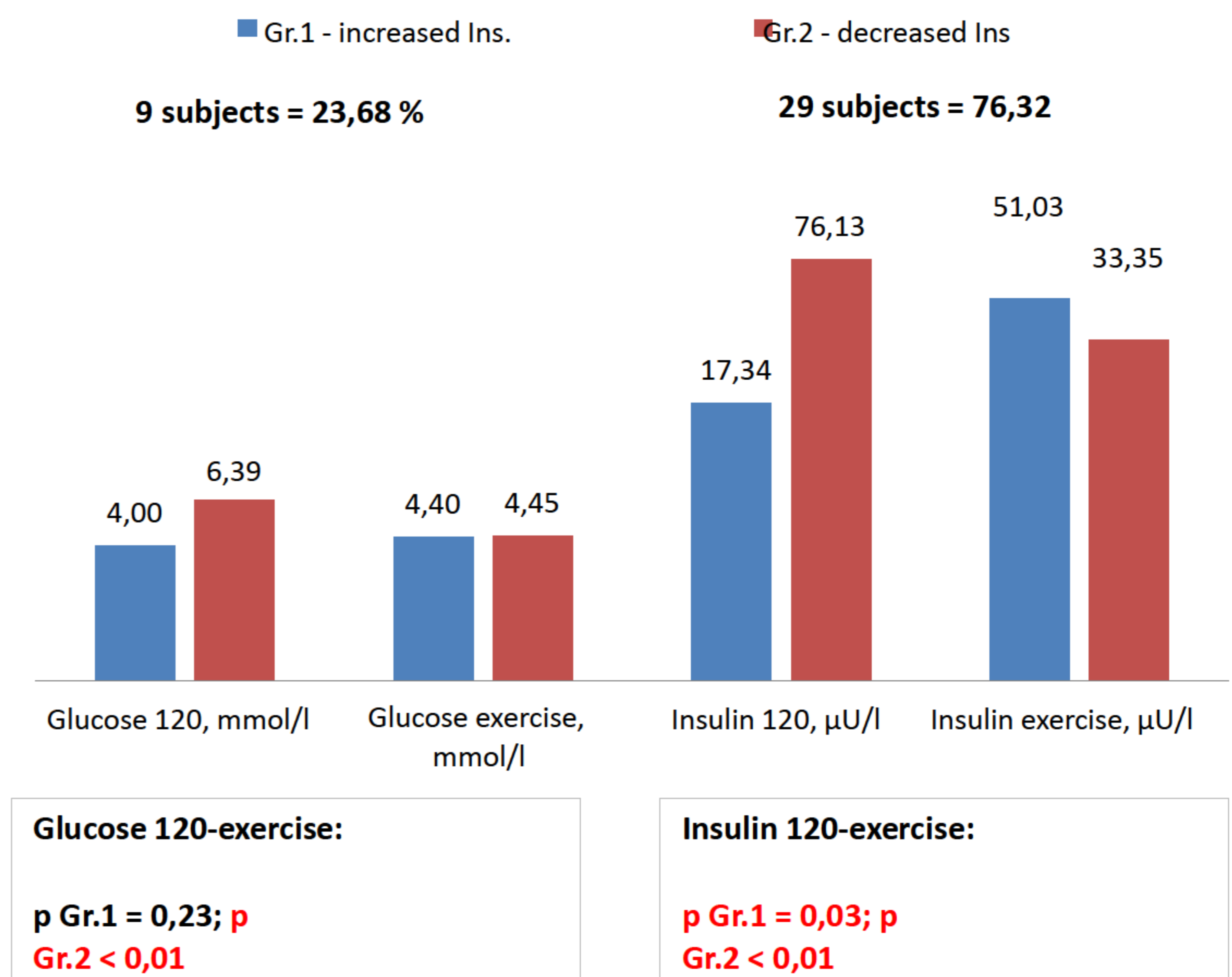
POPULATION and METHODS:

- 38 sedentary obese adolescent males aged $15,31 \pm 1,33$ were examined. There was no age difference ($p=0,16$).
- Standard two hours oral glucose tolerance test (OGTT) with further calculation AUC for glucose and insulin for increments: 0-30 min ($AUC_{gl.0-30}$; $AUC_{ins.0-30}$), 30-60 min ($AUC_{gl.30-60}$; $AUC_{ins.30-60}$), 60-120 min ($AUC_{gl.60-120}$; $AUC_{ins.60-120}$).
- Multi stage treadmill test (Bruce protocol) followed by measurement of insulin and glucose level at the moment test termination with calculation the relevant curves ($AUC_{gl.ex}$, $AUC_{ins.ex}$).

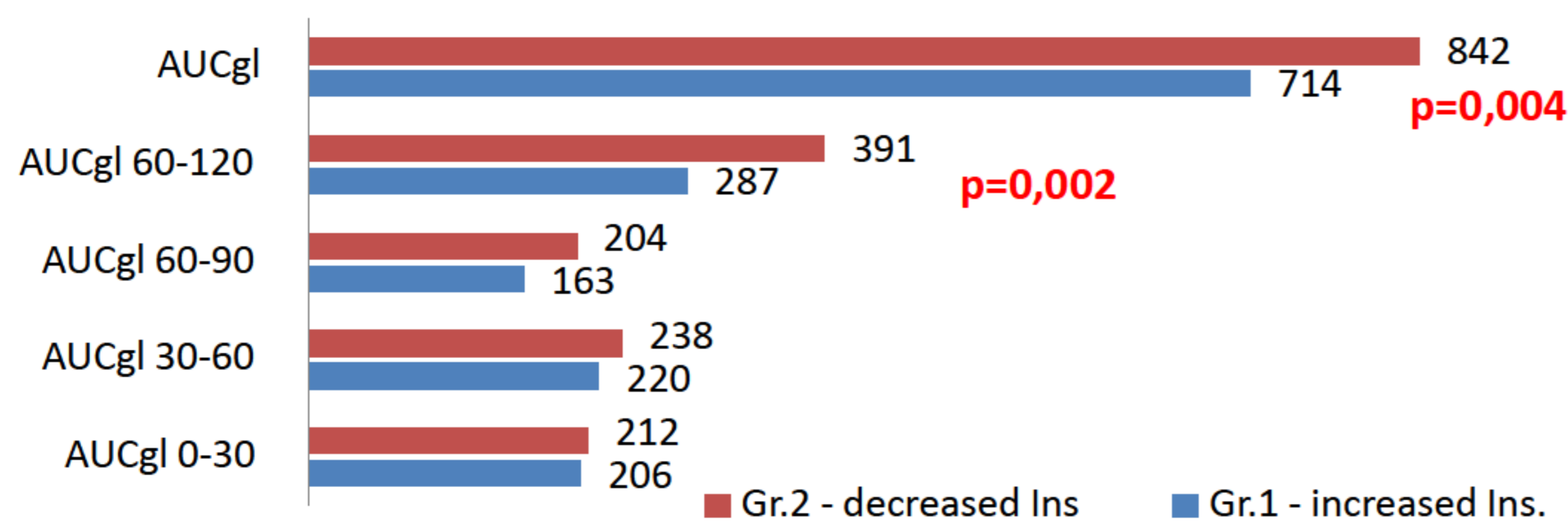
RESULTS

Parameters	Total		Gr.1, n.=9		Gr.2, n=29		P
	Mean	SD	Mean	SD.	Mean	SD	
Age, years	13,82	2,43	14,50	0,84	13,50	2,50	0,063
Z - post	0,64	1,35	0,14	0,57	0,74	1,44	0,330
Z - BMI	2,29	1,12	2,62	0,65	2,23	1,19	0,445
WHR	0,57	0,08	0,57	0,04	0,57	0,08	0,883
Glucose 0, mmol/l	5,37	0,64	5,17	1,17	5,41	0,52	0,405
Glucose 15, mmol/l	7,24	1,07	7,13	0,48	7,26	1,16	0,791
Glucose 30, mmol/l	8,33	1,44	8,08	1,44	8,38	1,46	0,651
Glucose 60, mmol/l	7,39	1,76	6,62	1,96	7,54	1,72	0,244
Glucose 90, mmol/l	5,79	2,12	4,27	1,29	6,08	2,13	0,053
Glucose 120, mmol/l	6,01	1,58	4,00	0,70	6,39	1,40	<0,001
Glucose exercise, mmol/l	4,44	0,61	4,40	0,75	4,45	0,60	0,849
Mean Glucose, mmol/l	6,69	0,98	5,88	0,92	6,84	0,93	0,025
Insulin 0, μ U/l	32,00	15,47	36,35	24,50	31,19	13,59	0,460
Insulin 15, μ U/l	74,09	29,04	78,38	16,50	73,28	30,96	0,699
Insulin 30, μ U/l	83,98	36,73	81,68	22,11	84,40	39,11	0,870
Insulin 60, μ U/l	91,47	37,41	75,97	44,89	94,38	35,91	0,274
Insulin 120, μ U/l	66,85	40,21	17,34	12,51	76,13	36,62	<0,001
Insulin exercise, μ U/l	36,14	28,23	51,03	35,08	33,35	12,02	0,028
Mean Insulin, μ U/l	69,68	21,94	57,95	16,77	71,88	22,31	0,156
HOMA-IR	6,91	3,53	7,42	5,91	6,82	3,03	0,707

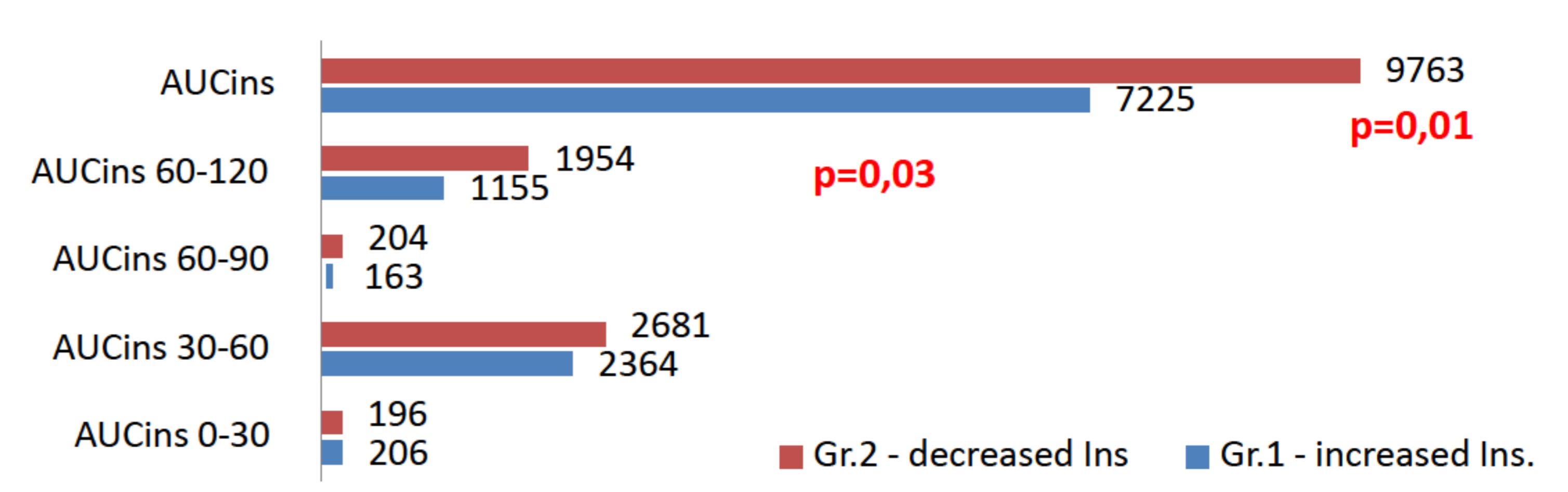
Different insulin response at the exercise after the OGTT



Total AUC for glucose during OGTT in groups different by insulin response for exercise



Total AUC for insulin during OGTT in groups different by insulin response for exercise



CONCLUSIONS:

1. Metabolic response at the exercise boot is dependent on insulin secretion at the glucose load.
2. Lower postprandial AUCins. and AUCgl. are associated with plasma insulin levels rise to correct the glucose immediately after exercise exhaustion.
3. Higher insulin input during OGTT is linked to exercise induced decreased insulin level in quarter of obese adolescents.
4. The named findings probably associated with degrees of deterioration of β -cell function and might explain different variants of exercise tolerance in obese subjects