

WHAT DOES THE INSULIN PUMP CHANGE IN CHILDREN WITH TYPE 1 DIABETES? ONE-YEAR CLINICAL FOLLOW-UP



Muhammet Mesut Nezir Engin, İlknur Arslanoğlu, Şengül Cangür

University of Duzce, Faculty of Medicine, Duzce, TURKEY

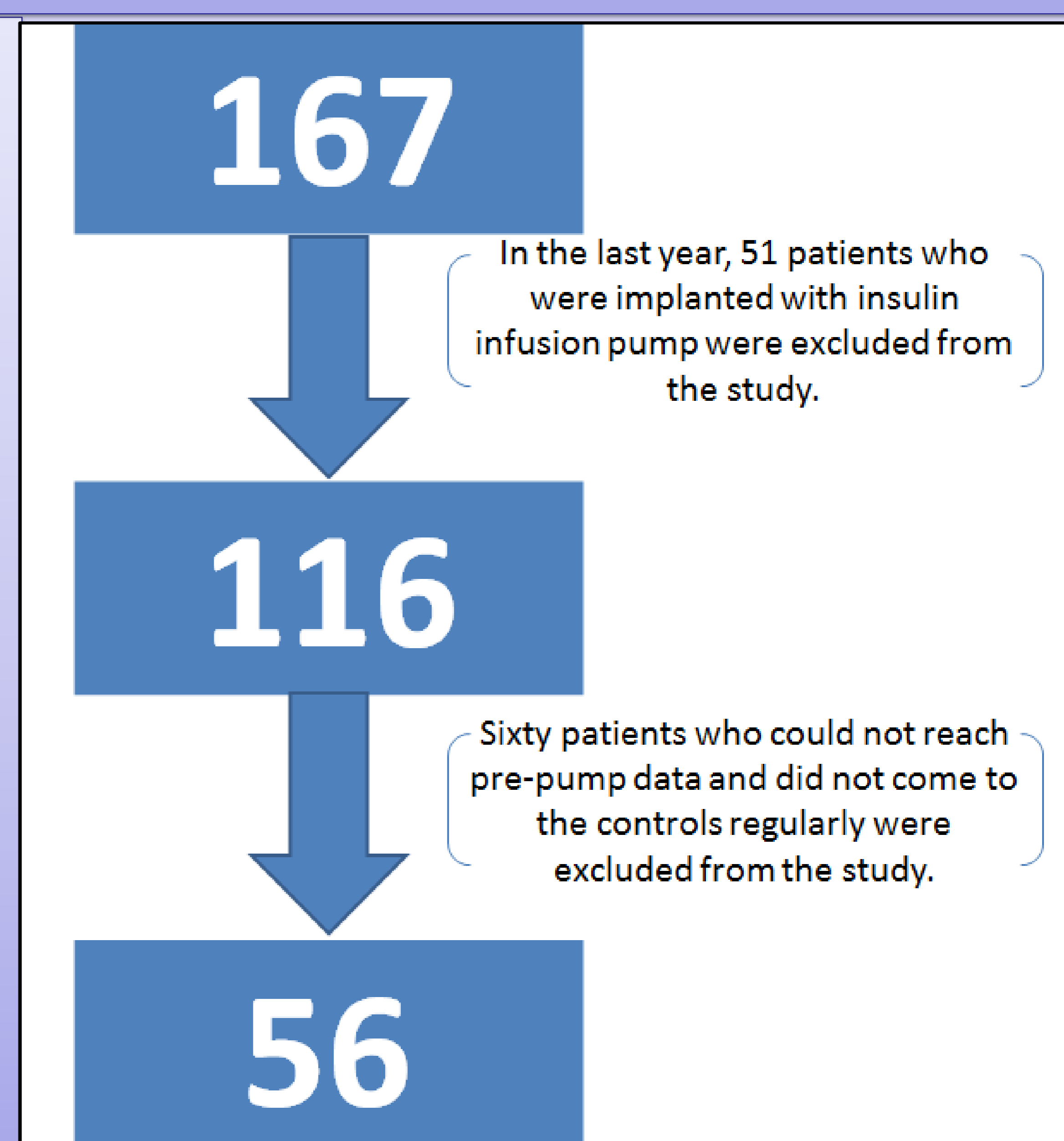


Aim

The insulin pump has an important contribution to quality of life and individualized insulin therapy. However, studies that observe clinical criteria sometimes reveal just marginal benefits or minor differences. Many studies compare different cohorts of pump using vs not using patients. In this study we aimed to compare the prospective effect of pump usage in same diabetic children.

Method

The records of 167 patients who were treated with pump therapy in our child diabetes center were examined. Patients were included if diagnosed at least one year before the use of insulin pump, followed at least one year after pump insertion and have anthropometric measurements as well as metabolic examinations available at the control visits. HbA1C levels, lipid profiles, body mass index (BMI), microalbumin/creatinine ratio and total insulin requirement (IU/kg/day) were compared. Descriptive statistics of all the data in the study were calculated (mean, standard deviation, minimum, maximum, median, 1.quartile and 3.quartile values). Kolmogorov-Smirnov and Shapiro Wilk tests were used for normality assumption control of quantitative variables. While Paired Samples t test was used to compare the normal distribution variables (insulin) measured at different visits, Wilcoxon test was used to compare the non-normally distributed variables (HbA1C, BMI, LDL, TG, Microalbuminuria).



Results

The mean age, diabetes and insulin infusion pump usage duration of 56 patients (27 girls, 29 boys) were 12.8 ± 3.6 years, 6 ± 3 years and 2.5 ± 1.5 years, respectively. The HbA1c values were significantly lower at the individual visits and on average compared to the one-year average prior to the use of the insulin infusion pump ($p < 0,001$). On the other hand, BMI values were significantly higher in individual visits and on average compared to the one-year average before the use of insulin infusion pump ($p < 0,001$). There was no significant difference in LDL, triglyceride microalbumin/creatinine ratio before and after infusion pump. To look at the insulin requirements Carelink download system was used during the pump period. During the pre-pump period, only 30 patients could be compared because those with just carbohydrate/insulin ratio records were excluded. The mean insulin dose was 0.73 ± 0.26 before the pump and 0.60 ± 0.27 during pump therapy. There was a nonsignificant decrease in insulin doses after the pump.

Table 1. Comparison of one-year average before and after pump and out-of-pump outpatient controls

	Pre-Pump Average	1. Outpatient control after pump	2. Outpatient control after pump	3. Outpatient control after pump	4. Outpatient control after pump	Average After Pump
HbA1C	9,43	8,7	8,8	8,6	8,6	8,65
	$p < 0,001$	$p < 0,001$	$p < 0,001$	$p < 0,001$	$p < 0,001$	$p < 0,001$
BMI	17,13	17,85	17,9	18,3	18,45	18,05
	$p < 0,001$	$p < 0,001$	$p < 0,001$	$p < 0,001$	$p < 0,001$	$p < 0,001$

Table 2. Comparison of one-year average values before and after the pump

	Daily Total Insulin Needs (IU/kg)	LDL	Trigliserid	Microalbumin / Creatinine Ratio
Before Pump	0,74	81,9	89,5	7,31
After Pump	0,6	89,5	78	7,81
	$p = 0,256$	$p = 0,154$	$p = 0,857$	$p = 0,196$

Conclusion

HbA1C levels regressed steadily after the use of insulin infusion pumps, whereas BMI was found to increase. Although the decrease in total insulin requirement is not statistically significant, regarding the higher BMI and lower HbA1C it may still significant from the clinical point of view.

