Seasonal variation and epidemiological parameters in children from Western Greece with Type 1 Diabetes Mellitus (T1DM).

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INTRODUCTION/OBJECTIVE

A positive correlation between the onset of T1DM and winter has been suggested by studies conducted in different countries. We investigated the seasonal variation of T1DM diagnosis and additional epidemiological parameters in children from Western Greece diagnosed with T1DM.

METHODS

105 patients, 44 males and 61 females, aged 1 to 16 years (mean: 8.2±4 years) were studied. The date of the diagnosis, the order of birth, gestational age, birth weight, the mode of delivery, parental age and pubertal status were recorded from the patients' files.

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6
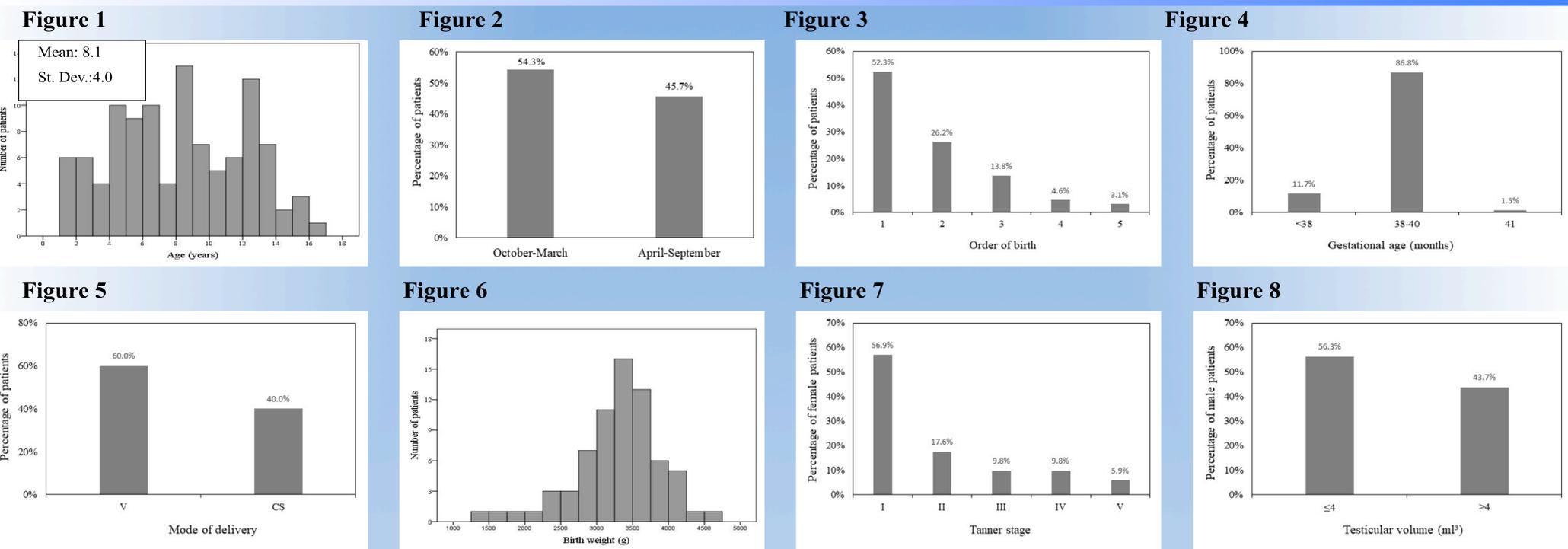
Figure 7

Figure 8

Figure 1. Histogram of the age of children diagnosed with T1DM at the time of the diagnosis.
Figure 2. Incidence of diagnosis of T1DM during the cold and warm months.
Figure 3. Percentage of patients diagnosed with T1DM in relation to the order of birth.
Figure 4. Gestational age of patients diagnosed with T1DM.
Figure 5. Percentages of patients with T1DM born by normal vaginal delivery (V) and caesarean section (CS).
Figure 6. Histogram depicting the variation of the birth weight of children diagnosed with T1DM.
Figure 7. Tanner stages of breast development at the time of diagnosis of T1DM in the female population.
Figure 8. Percentage of pre-pubertal (testicular volume ≤4 ml^3) and pubertal boys   (testicular volume >4 ml^3).

RESULTS

The mean age at diagnosis was 8,2 ± 4 years (min: 1, max: 16). The majority of the studied patients were diagnosed during the 6-month period of October to March (57 patients – 54%), as compared to the warmer months of April to September (48 patients – 46%). 51% of the children were first born and 87% were born at full term, whereas 11,5% were pre-term babies. 61% were born by vaginal delivery and 39% by caesarean section. The mean birth weight was 3261 ± 595 g (min: 1335g, max: 4550g). The majority of the patients were pre-pubertal at diagnosis.

CONCLUSIONS

Our results are in agreement with the reported seasonal variation of T1DM onset in other Greek, but also European, populations. The positive correlation between T1DM presentation and colder months may be explained by factors that are related to lower temperature, such as infections. The majority of the children were first-born, born at full term, with a normal birth weight and pre-pubertal at diagnosis. Although most children were born by vaginal delivery, a significant percentage was born by caesarean section, which is a possible risk factor for the development of T1DM in susceptible subjects.

REFERENCES

1. Gorham ED, Barrett-Connor E, Highfill-McRoy RM, et al (2009) Incidence of insulin-requiring diabetes in the US military. Diabetologia 52:2087-2091.
2. Samuelsson U, Carstensen J, Lofman O, et al (2007) Seasonal variation of type 1 diabetes mellitus in south-east Sweden. Diabetes Res Clin Pract. 76:75-81.
3. Ostman J, Lonnberg G, Arnqvist HJ, et al (2008) Gender differences and temporal variation in the incidence of type 1 diabetes: results of 8012 cases in the nationwide Diabetes Incidence Study in Sweden 1983-2002. J Intern Med 263:836-894.