

# Autism in the Haifa Area — An Epidemiological Perspective

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**Key words:** autism, pervasive developmental disorder, incidence, epidemiology, Israel

## Abstract

**Background:** Autism is a pervasive developmental disorder. The incidence rate and other related epidemiological characteristics of the Israeli population are not available.

**Objectives:** To assess the incidence rate of autism in the Haifa area and to compare family characteristics with previous reports from other countries.

**Methods:** We approached facilities in the Haifa area that are involved with the diagnosis and treatment of autism. The study group comprised children born between 1989 and 1993. Records of the children were scrutinized and 69% of the mothers were interviewed. Live-birth cohorts of the same years were employed for incidence computation.

**Results:** An incidence rate of 1/1,000 was derived. Male to female ratio was 4.2:1. Pregnancy and perinatal periods were mostly uneventful. A low prevalence of developmental and emotional morbidity was reported for family members.

**Conclusions:** The epidemiological characteristics found in the Haifa area are similar to those reported from non-Israeli communities. This finding supports an underlying biological mechanism for this disorder. These data can be used for future trend analyses in Israel.

*IMAJ 2001;3:188-189*

For more than a decade, epidemiological reports have suggested an increase in the incidence of autism [1]. However, increased awareness and changes in diagnostic criteria are important factors that might affect incidence estimates. Data related to epidemiological aspects of autism are particularly important for the development of services, but this information is not available in Israel. The purpose of the present study was twofold: to describe the incidence of autistic disorder between the years 1989 and 1993 in a well-defined geographical area in Israel, and to compare the incidence as well as other clinical and family characteristics with similar data published from other countries.

## Methods

We approached those facilities in the Haifa area designated for the diagnosis and/or treatment of children with communication and behavioral disorders, including pervasive developmental disorder. The Child Development Center, the main unit for behavioral and psychological consultation, and two other private services outside the city, all of which treat children with

PDD from the same catchment area, were included in this study. During the study period no other professional therapeutic agencies were available in the area.

We reviewed the files of all children diagnosed with autistic disorder (DSM III R/IV [2,3]) who were born between 1989 and 1993 in the Haifa area. In order to avoid diagnostic ascertainment bias, the Arab population (constituting about 7% of the population in the area of the study) was excluded. One file was missing, and one child diagnosed with fragile X syndrome was excluded. The files consisted of family, demographic and medical history, the child's medical history and developmental and neurological data. Missing data were obtained from medical records of the referring agencies, e.g., hospitals. For ascertainment purposes all mothers who gave their consent were interviewed. The interview covered data pertaining to socioeconomic status, family and child's medical history, pregnancy and delivery and number of siblings. Father's occupation was used for socioeconomic classification [4].

As the denominator for the present study, birth cohorts of the years 1989–93 were employed (Israel Central Census Report 1989–1993). There were 26,160 Jewish live births between January 1989 and December 1993. For analysis purposes incidence and proportions were derived.

## Results

Autistic disorder was identified in 26 children (21 males and five females) on the basis of the inclusion criteria specified in the Methods section. The derived incidence was thus 1/1,000. The sex ratio was 4.2 male:1 female. The age at initial assessment was 32.2 months (10.1 SD) and the ultimate diagnosis was assigned within a period of 1–2 months. Pregnancy was complicated in two children only (twin pregnancy and gestational diabetes in one, and vaginal bleeding in another). Delivery was complicated in four (two instrumental deliveries and two cesarean sections with no evidence of intrapartum asphyxia). Birth order was distributed as follows: first born 37.5%, second and third born 29.2% each, and fourth born 4.1%.

Paternal and maternal age at the time of diagnosis was 34.3 years (4.3 SD) and 31.2 years (4.6 SD) respectively. Mild dyslexia was reported in one father and a "communication problem" in another. The mean number of siblings was 1.4 (0.6

PDD = pervasive developmental disorder

SD). Speech delay was reported for one brother only. In four families a second-degree relative with the following diagnoses was reported: a grandfather with manic-depressive disorder, an aunt with depression, a cousin with mental retardation, and a cousin with PDD. Socioeconomic status was distributed as follows: 1 = 37.5%, 2 = 20.8%, 3 = 37.5%, 4 = 4.1%, with 1 and 4 representing higher and lower socioeconomic status respectively.

## Discussion

The epidemiological research in autism, to date, has focused on prevalence rate rather than incidence. Prevalence analysis, however, does not facilitate a reliable evaluation of time-dependent trends. It also may be misleading as it pertains to a geographic area without taking birthplace into account. Our aim was to study incidence rate and thus provide basic information for future trend analysis. A study in Osaka, Japan [5], relating to the same time period of the present study found an incidence rate identical to ours (1/1,000), while another study from Japan [6] reported an incidence rate of 1.6/1,000 in 1988. In a recent report from Wales, Webb et al. [7] noted an incidence rate of 0.66/1,000 live births in 1989; however, in 1988 the incidence rate revealed in the same study was 0.9/1,000 live births, which is similar to the incidence reported in the present study. Difference in incidence rates could result from the use of different definitions; while some researchers employed a broader definition other studies used "classical autism" as defined by the DSM IV [2].

The preponderance of males among children with autism is similar to that reported consistently in previous reports in other communities [8]. The mean age of diagnosis noted in the present study is much older than the ages of the children diagnosed in our center today (approximately 18–24 months). Since the diagnosis is reconfirmed, this difference probably reflects increased awareness and improved diagnostic skills in the community rather than over-diagnosis.

The percentage of firstborn children with autism (37.5% in the present study) differed from that reported by Gillberg et al. – 58% [9], but this difference could be attributed to the lower size (0.97) of the sibship in the Swedish study. In a similar study performed in Utah, USA [10], the percentage of firstborn (31%) was more similar to that reported in our study. It should be noted that our study did not record the size of sibship.

The distribution of socioeconomic status indicates that autism affects children from all economic strata. This finding is also consistent with reports from other countries [10]. Similar to another study [11], our results indicate that perinatal events are rather uncommon in children with autism. In contradiction to a previous report [12] of increased prevalence of developmental and emotional problems in first- and second-degree relatives with autism, our study demonstrated a comparably low prevalence. The data pertaining to morbidity among other family members in the present study were retrieved from children's records and maternal interviews. It is possible that the

lack of ascertainment of these morbidities in other family members contributed to this low prevalence.

In conclusion, the incidence of autism in the Haifa area reported in our survey is similar to the incidence reported for other countries. It appears that other epidemiological characteristics are also similarly distributed. An exception to this trend is the low rate of reported developmental/emotional morbidities in other family members. The equal incidence reported by different communities supports the hypothesized biological mechanism of autism. Future annual surveys could be used for incidence trend analysis. The use of standardized diagnostic criteria and an ongoing national reporting system will allow a reliable estimate of service needs for children with autism in the different age groups.

**Acknowledgement:** The authors thank Tsofia Smootha and Hanna Kaminer from the Milman Center for Children with Developmental and Communication Disorders for their help in this project.

This project was supported in part by the collaborating grant of the Ministry of Health, the Technion-Israel Institute of Technology, and the Bnai Zion Medical Center.

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