

respiratory, cardiovascular, and alimentary systems, and fewer malformations of the genitourinary and integumentary systems than singletons.

Concordance rates were significantly higher among MZ twins than among DZ for any malformation, and for the categories of single and minor malformations.

Dr. N.C. Myrianthopoulos, NINDS, NIH, Bethesda, Maryland 20014, USA

ANTE- AND POSTNATAL FACTORS AFFECTING LEUKEMIA IN TWINS

L. KEITH, E.R. BROWN, B. AMES,
M. STOTSKY, D.M. KEITH

Division of Obstetrics, Cook County Hospital, Chicago, Illinois, USA

In our 1971 publication of the "Epidemiologic Study of Leukemia in Twins", several significant trends which may have affected the occurrence of this disease were brought to light. The perinatal-congenital period was the time during which concordance was notably highest. Concordance was observed to diminish in later life.

Prior to July 1971, 71 cases of leukemia in twins were reported in the literature. Since then, approximately 17 more cases have been reported. These reported cases cannot be used to determine incidence and prevalence rates since the actual number of twins afflicted with leukemia worldwide is unknown, as is the number of sets of twins presently living.

Reports published since 1971 strengthen the impression that four basic factors affect concordance of leukemia among twins: (1) exposure to ionizing radiation; (2) chromosomal changes; (3) conjoined intrauterine circulation, and (4) direct metastasis.

The cumulative reports of Alice Stewart strongly suggest that routine antenatal radiation is potentially carcinogenic. Although a minimal harmful dose has not yet been established, in light of the available statistics it seems incumbent upon the obstetrician to use the utmost discretion in deciding which radiographic studies must be performed, continuously bear in mind the more benign alternative of ultrasound. The conjoined intrauterine circulation model in twins dramatically modifies the idea of a placental barrier. By means of tracer substances, leukemic cells have been shown to cross the so-called placental barrier, consequently increasing the plausibility of direct metastasis of leukemic cells from mother to child. Also, a series of vessel-to-vessel anastomoses, existing antenatally, is quite feasible in MZ pairs and is an enticing explanation for the high incidence of concordance among such twins early in life.

We suggest long-term longitudinal follow-up studies be performed in the nonleukemic twin of a discordant pair in order to determine the earliest onset of preclinical disease. The results of such studies could conceivably shed light on the question of environmental or hereditary factors influencing the course of leukemia in twins.

Prof. Louis Keith, Division of Obstetrics, Cook County Hospital, 1825 West Harrison Street, Chicago, Illinois 60612, USA

2. Twin Psychology

THE TWIN CONDITION AND THE COUPLE EFFECTS ON PERSONALITY DEVELOPMENT

RENÉ ZAZZO

Laboratory of Child Psychobiology, Paris, France

Twin psychology has been studied to a very limited extent. Only few remarkable peculiarities of the twins' development are known for sure, such as delayed intellectual development, language retardation with fre-

quent cryptophasia, difficulties and fragility of self consciousness, reduced sociability. Bachelorhood is much more frequent in adult twins than in the general population. These peculiarities obviously hold true only in the average twin population and characterize MZ much more than DZ twins. They may result from a number of different factors: biological (higher risks in fetal development, prematurity, and therefore hampered further development), peculiar parental attitude, and the twin situation itself. The latter would appear to be the most

important factor: the twin individual is psychologically formed in a life of couple. The psychology of the twin as an individual is a function of the psychology of the twin pair. The characteristics of twins are mainly due to the couple effects.

Twin peculiarities have for a long time been ignored. On the one hand, psychology ignored the couple reality (it was a "one-body" psychology), and on the other, the twin method classically postulated that twins are not atypical and may therefore be used as a test for the general population. As a matter of fact, twin psychology opens a new way to science. The twin situation may serve as a paradigm for the general study of the couple effect, namely, for the objective analysis of personality as a consequence of the relations between self and others. For certain traits of personality, it is already known that MZ twins brought-up together are significantly less similar than MZ twins brought-up apart. In fact, couple effects may mask or considerably reduce genetic factors.

Prof. René Zazzo, Laboratoire de Psycho-Biologie de l'Enfant, 41 rue Gay-Lussac, Paris V, France

THE PROCESS OF IDENTITY IN TWINS

S. CIRILLO

Department of Psychology, Catholic University, Milan, Italy

Abstract not received.

WITHIN-PAIR RELATIONS IN MZ AND DZ FEMALE TWINS

M. COLNAGHI

The Gregor Mendel Institute of Medical Genetics and Twin Research, Rome, Italy

Abstract not received.

THE LANGUAGE DEVELOPMENT OF TWINS

PETER MITTLER

Hester Adrian Research Centre for the Study of Learning Processes in the Mentally Handicapped, University of Manchester, England

Although several studies have established that twins tend to be delayed in language acquisition, it is still not clear whether the delay is greater in some aspects of language development than in others, whether it affects both MZ and DZ twins and whether twins considered as individuals are subject to the same environmental and social class influences on language development as singletons.

The present paper presents a brief review of earlier work, and summarises a study comparing the psycholinguistic skills of 200 four-year-old twins, all aged 48 months, and 100 singletons of the same age. All the children were assessed on a battery of verbal and nonverbal tests, including the Illinois Test of Psycholinguistic Abilities. Main results were as follows:

- (1) Twins were on average six-months retarded in language age compared to singletons.
- (2) MZ and DZ twins were equally retarded.
- (3) All aspects of language appeared to be affected.
- (4) Intraclass correlations were significantly higher for MZ than for DZ pairs.
- (5) The contribution of genetic factors appeared to be higher for visual-motor than for auditory-vocal channels, the latter being strongly environmental in origin.
- (6) The language retardation of twins relative to singletons was much more marked in middle class than in working class twins.

Prof. Peter Mittler, Hester Adrian Research Centre for the Study of Learning Processes in the Mentally Handicapped, University of Manchester, England