Inguinal hernia in patients with congenital dislocation of the hip

A sign of general connective tissue disorder

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During a 5-year period, all the children born in Malmö, Sweden, were examined for congenital dislocation of the hip (CDH) and for inguinal hernia. Girls with CDH had a hernia five times more frequently than other girls, and boys with CDH three times more frequently. The children with CDH sustained their hernia abnormally early in life. We suggest that relaxin, which stimulates collagenase, could alter the connective tissue and be of importance for the development of both CDH and the hernia.

Patients with abnormalities of the connective tissue often sustain an inguinal hernia, e.g., in Marfan's syndrome, homocystinuria, cutis laxa, and osteogenesis imperfecta (McKusick 1972). There are also a few reports of an increased prevalence of hernia in children with congenital dislocation of the hip (CDH) (Wynne-Davies 1970, Bjerkreim and van der Hagen 1974, Fredensborg 1975). However, there is no epidemiologic study of the coincidence of hernia and CDH in a defined population. We have compared the risk for children with CDH to sustain a hernia with that of the general population.

Patients and methods

In the city of Malmö more than 99 percent of all the children are delivered at Malmö General Hospital and are screened for CDH at the maternity ward. From 1981 through 1985, 11,891 children were born (Table 1). The Ortolani and Barlow tests were used as described by Palmén (1984). Children with instability of the hip were referred to the Department of Orthopedics for treatment and follow-up. The unstable hips were categorized as 1) possibly unstable, 2) definitely unstable, or 3) dislocatable, or 4) dislocated. Included in this study were all the children born from 1981 through 1985 with a Grade 2 CDH or more, treated with a von Rosen splint. Included were also 5 children with a late diagnosis of CDH.

All the patients treated at the Department of General Surgery are registered according to diagnosis and operation. Included in this study were all the patients born between 1981 and 1985 inclusive, who between 1981 and 1987 were operated on for inguinal hernia (Table 1).

Table 1. Children born in 1981–1985. Figures are number of patients (percent)

		Patients		
		With CDH	With hernia	With CDH and operated on for hernia
Boys	6 194	33 (0.5)	204 (3.3)	3 (9.1)
Girls	5 697	157 (2.8)	67 (1.2)	8 (5.1)
All	11 891	190 (1.6)	271 (2.3)	11 (5.8)

The Fisher exact probability test was used in the statistical analysis.

Results

The girls with CDH contributed to 8 of the 67 girls operated on for inguinal hernia (Table 1). The risk for a girl with CDH to sustain a hernia was 4.8 times greater as compared with the other girls ($P = 0.0001$). Only 3 boys with CDH were operated on for inguinal hernia; the risk was but 2.8 times higher as compared with other boys (NS).

The median age at the operation was 1 month for boys with CDH (1 week–2.5 months) and 1.5 months (1 week–56 months) for girls. The corresponding figures for the the non-CDH boys and girls were 8 months (1 week–65 months) and 10 months (1 week–58 months), respectively. Thus, children with CDH were often younger when operated on for hernia.

The 3/3 boys and 7/8 girls with CDH were operated on for hernia within the first 3 months of life. Of the

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other children operated on for hernia, only 83/204 of the boys and 22/67 of the girls were operated on within the same age. Thus, the risk of sustaining a hernia within the first 3 months of life is 6.7 times greater for boys with CDH ($P = 0.02$) and for girls 11.2 times greater ($P < 0.0001$). The girls with CDH contributed to almost a quarter of all the girls operated on for hernia within the first 3 months of life.

Discussion

Inguinal hernia in children is reported to occur in 1–4 percent (Korvald and Knutrud 1965, Jones and Woodward 1986); we had an incidence of 2.3 percent. The incidence of hernia in girls, however, was higher than expected, every fourth patient being a female (Donaghy et al. 1982, Harvey et al. 1985). The children in this study, however, were not followed to adulthood, so the absolute incidence of hernia during childhood cannot be determined.

In our study, children with CDH were operated on for hernia more frequently than others. In previous reports on hernia in CDH, there was no comparison group, but the occurrence of 3 patients with inguinal hernia among 345 girls with CDH was considered to be unexpectedly large (Wynne-Davies 1970), with a prevalence at the same level as in our comparison group.

The higher incidence of hernia among boys is likely due to anatomic factors, whereas in girls alteration of the connective tissue may be of more importance. However, also in cases with direct inguinal hernia in men, collagen abnormalities have been reported. Wagh et al. (1974) suggested that a failure of hydroxylation of the proline in collagen could be a cause.

A persisting joint laxity has been described in CDH (Carter and Wilkinson 1964, Fredensborg 1975). However, the children with CDH got their hernia very early in life, indicating that some special perinatal factor could be of importance. The concentration of relaxin in serum is increased during pregnancy (MacLennan et al. 1986a), especially in women with pelvic joint instability (MacLennan et al. 1986b). Relaxin has been shown to stimulate collagenase also in cells from human amnion and chorion (Koay et al. 1983), which can explain the low content of collagen in the umbilical cord of children with CDH (Fredensborg and Udén 1976, Jensen et al. 1986) and also the pelvic instability in children with CDH (Andrén 1960).

Explanations for the increased association of CDH and hernia could be the increased level of maternal relaxin or increased sensitivity of the receptors of the fibroblasts in children with CDH.

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