

Characteristics of Fatal Child Maltreatment Associated with Multiple Births in Japan

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The purpose of the present study was to clarify the characteristics of fatal child maltreatment in families with multiple births in Japan. An exhaustive information search was performed to find multiple-birth cases between July 2003 and March 2011. There were 437 cases of fatal maltreatment of children aged 0–17 years during this period, including 14 involving multiple-birth children. A keyword search was performed to create a full profile for each multiple-birth case. The 14 multiple-birth victims were twins from 13 families. No significant difference between twins and singletons with fatal maltreatment was observed for most characteristics. However, in the case of twins, 0-month victims were rare, and the number of children per family was larger. One twin died from shaken baby syndrome. The victim's siblings were also maltreated in six out of 12 relevant cases, including all six co-twins. Premature birth, having a disabled co-twin, delay of growth or development, and parental disfavor tended to be factors of maltreatment when only one twin was maltreated. Four families were given suspended sentences in total, including three mothers who acted as solitary murderers (43% = 3/7). In conclusion, recent Japanese nationwide data suggests that the non-specific overburden of child rearing might be one possible reason for higher frequency of child maltreatment for multiples compared with singletons, and parental comparisons between two twins might be another. The penal sentences for fatal child maltreatment might be more lenient for perpetrators of this crime against twins than against singletons.

■ **Keywords:** fatal child maltreatment, families with multiple births, nation-wide data, twins

Multiple births were recognized as a risk factor for child maltreatment in several studies in the 1980s (Groothuis et al., 1982; Nelson & Martin, 1985; Robarge et al., 1982; Tanimura et al., 1990). Although being outdated, these earlier studies were not necessarily population-based. It is of little doubt that the current situations surrounding families, for example, family planning, including assisted reproductive technology, child rearing, and maternal/paternal age are quite different today.

In a previous paper by this author (Ooki, 2013), the impact of multiple births in cases of fatal child maltreatment (child deaths by maltreatment) using nationwide data in Japan was estimated. The relative risk (RR) of multiple births per individual was around 2.0–3.0, and the RR of multiple births per family unit was around 4.0–5.0. It was found that families with multiple births had elevated risk for fatal child maltreatment both per individual and per family unit. The purpose of the present study was to further clarify the characteristics of fatal child maltreatment of families with multiple births.

Methods

National annual reports on fatal child maltreatment (first to eighth report) published from 2005 to 2012 by the Ministry of Health, Labor and Welfare of Japan (in Japanese) were used as the initial source of information for the present data analyses. All cases of fatal maltreatment of children from 0 to 17 years of age between July 2003 and March 2011 were analyzed. The annual reports tally the cases of fatal child maltreatment (per individual or family unit) according to whether or not the child's death was accompanied by parent's suicide. Cases of child murder followed by parental

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suicide were excluded from the present analysis, as the background and risk factors may be different from those in cases of fatal child maltreatment without suicide.

The number of multiple-birth cases according to calendar year of incidence was the only available information regarding multiples in the national annual reports. The present author performed an exhaustive information search regarding multiple-birth cases using keyword searches in an Internet search engine to create a full profile for each case. For reliable data sources, entire texts of several newspaper stories were reviewed for each fatal maltreatment case and the following information was gathered: (1) victim's sex/age, (2) perpetrator's age, (3) relationship between child and perpetrator, (4) family information, (5) situation of maltreatment and cause of death, (6) maltreatment of other children, (7) background and risk factors, and (8) sentence.

Multiples and singletons were compared using χ^2 test or Fisher's exact probability test, with a threshold significance level of 0.05. Multiples were also analyzed as pairs. The percentage and estimated population rate were calculated according to sex-combination and parity. The pair-wise concordance rate of maltreatment, including survival cases, was also calculated.

Results

There were 437 reported cases of fatal child maltreatment between July 2003 and March 2011. Among these were 14 multiple-birth victims. All 14 multiples were identified through an intensive Internet search. They were all twins, and originated from 13 families.

Table 1 shows detailed information of cases. Of these, seven victims were females, and eight victims were 0-year old. The mean number of children in one family was 3.2 (=42/13). All except one perpetrator (an uncle of twins) was biological father or mother of the twin. The perpetrators were mothers only (solitary murderer) in seven cases, fathers only in two cases, and both parents in three cases. Four mothers had experienced teenage childbirth of twins. Four or five mothers had experienced divorce in their life course. Four fathers out of 10 did not have a regular occupation. The method of maltreatment was physical maltreatment in 10 cases and neglect in five cases (multiple answers allowed). One case (ID-14) was obviously a case of shaken baby syndrome (SBS).

Premature birth (ID-10), having a disabled co-twin (ID-2), delay of physical growth (ID-10) or language development (ID-9), and parental disfavor (ID-8) tended to be associated factors in maltreatment in cases when only one twin was maltreated. On the other hand, family dysfunction, namely lack of ability to make a living, including no regular occupation of father (ID-1, ID-4, ID-6, ID-12, 13), lack of ability of child rearing of mother/father (ID-7), and unexpected childbirth (ID-6) were observed when both twins were maltreated.

The sentence for the perpetrator was identified for 12 families. Four families were given suspended sentences, representing 33% (=4/12) of all families and 43% (=3/7) of the cases with the mother as solitary murderer.

The results of statistical tests and estimations are shown in Table 2. No significant difference between twins and singletons with fatal maltreatment was observed for most of the items. However, no 0-month victim was observed among twin victims ($p < .01$), which produced statistical significance. Also, the number of children per family was larger in families with twins ($p < .01$). No specific feature was observed regarding psychological problems of mothers.

Multiples were analyzed as pairs. The proportion of female victims of opposite-sex pairs was 0.36% (95% CI = 0.16–0.61), and the proportion of male victims of same-sex pairs was 0.43% (95% CI = 0.21–0.67). Other siblings of victims in 12 pairs were also maltreated in six cases, including all co-twins of the six index twin victims. Thus, the pair-wise concordance rate of child maltreatment where index twins were fatal was 0.50 (=6/12, 95% CI = 0.25–0.75).

Discussion

There have been very few studies on maltreatment in cases of multiple births despite the general recognition that multiple births increase the risk of child maltreatment. The first large study that treated the relationship between families with multiples (twins) and child maltreatment was that of Robarge et al. (1982) and their expanded study (Groothuis et al., 1982). In an intensive literature search, the author could find no systematic study of fatal child maltreatment of multiple-birth children before these two studies.

Risk Factor of Maltreatment as Individual Multiples or Families with Multiples

Most of the child and parental factors related to fatal maltreatment did not differ between cases with twin and singleton victims. The only two differences that emerged were that 0-month victims were rare, and the number of children per family was larger in multiple-birth cases than singleton cases. The mean number of children per family was significantly larger for the multiple-child subset compared to total reported child fatal maltreatment cases (Table 2) or the Japanese general population (mean number is 1.3 according to recent vital statistics). In the case of families with multiples, parent(s) must rear at least two children of the same age at the same time. It was pointed out decades ago that close spacing of children might be a significant risk factor for subsequent child maltreatment (Robarge et al., 1982). The annual reports by the Ministry of Health, Labor and Welfare of Japan also pointed out that having more than one child, including multiples, is one of the risk factors for child maltreatment, although no evidence has been shown by the Ministry. The present results and the higher

TABLE 1
Case Details of Fatal Child Maltreatment for Twins

ID	Victim		Perpetrator (age)	Genogram	Occupation		Method of maltreatment and cause of death	Maltreatment of other children	Background and risk factors	Sentence
	Sex	Age			Father	Mother				
1	F	4 m	Biological father (26), biological mother (34).	Father, mother, 6 children including opposite-sex twin pair (two children from former marriage of mother).	No	No	Neglect (under-nutrition, collapse).	Yes (co-twin died from suffocation, although not counted as fatal maltreatment).	Premature baby (1,100 g birth weight), many children, divorce and second marriage of mother, lack of ability to make living, no support for child rearing from husband, impulsiveness of father.	Penal servitude 2 years and 6 months for both parents.
2	F	6 y	Biological father (32), biological mother (31).	Father, mother, opposite-sex twin pair.	Yes	No	Neglect (little feeding), physical maltreatment (death from acute subdural hematoma caused by head bruise).	No	Premature baby, cerebral palsy of co-twin, mental disorder (depression and PTSD) of mother, mother's experience of getting bullied when in junior high school, no support for child rearing from husband, lost access to grandparents.	Penal servitude 3 years, suspended jail term (5 years) for both parents.
3	M	2 y	Uncle (36, elder brother of biological father of twins).	Uncle, aunt, three cousins, male-male twin pair.	-	-	Physical maltreatment (acute cerebral herniation due to subdural hematoma).	Unknown (including co-twin).	Non-biological child of perpetrator, many children.	Penal servitude 4 years.
4	M	1 m	Biological father (24).	Father, mother (26), first-born daughter (2), male-male twin pair.	No	Unknown	Physical maltreatment (skull fracture and acute subdural hematoma).	Yes (co-twin had internal hemorrhage from head).	Low ability of child rearing.	Penal servitude 5 years and 6 months.
5	F	1 y 11 m	Biological mother (43).	Mother, opposite-sex twin pair.	-	No	Physical maltreatment (traumatic subarachnoidal hemorrhage, death by intracranial injury due to battery on the face and head).	No	Impulsiveness, fatherless family.	Penal servitude 5 years and 6 months.
6	M	8 m	Biological father (29), biological mother (21).	Father, mother, first-born daughter (1 y 10 m), male-male twin pair.	No	No	Physical maltreatment (repeated punching and biting, many fractures, lifted the victim up and threw him on to the floor reportedly, anoxic encephalopathy), neglect.	Yes (for co-twin from 4 months after birth).	Unexpected twins, teenage pregnancy, low ability to make living.	Penal servitude: father 12 years, mother 8 years.
7	M	2 y	Biological mother (29).	Mother, first-born son (6 y), opposite-sex twin pair.	Yes	No	Neglect (under-nutrition, collapse, three children were left behind for 10 days).	Yes (co-twin was emaciated, non-twin elder brother was also neglected, but had no health problems).	Divorce of perpetrator's parents, domestic violence of perpetrator's father (PTSD), divorce of perpetrator, low ability of child rearing, transfer of common-law husband not accompanied by family.	Penal servitude 6 years.

TABLE 1
Continued

ID	Victim		Perpetrator (age)	Genogram	Occupation		Method of maltreatment and cause of death	Maltreatment of other children	Background and risk factors	Sentence
	Sex	Age			Father	Mother				
8	F	1 y	Biological mother (23).	Mother, first-born son (3 y), opposite-sex twin pair.	-	Yes	Physical maltreatment (stomping on the abdomen, death from intra-abdominal hemorrhage, daily beating of the head, etc.).	No (both first born son and co-twin).	Teenage childbirth and divorce of perpetrator, mental disorder (bulimia nervosa) of the perpetrator, impulsiveness.	Penal servitude 4 years.
9	F	3 y	Biological mother (22).	Father (33), mother, opposite-sex twin pair, second-born daughter (10 m).	Yes	No	Physical maltreatment (beating and many bruises, visceral injury, acute subdural hematoma).	No (both co-twins and second-born daughter).	Teenage pregnancy, delay of language development, child-rearing anxiety.	Penal servitude 4 years and 6 months.
10	F	4 m	Biological mother (27).	Grandmother (maternal) (60), father (35), mother, female–female twin pair.	Yes	Yes	Physical maltreatment (dashed down to the mat and death from cranial fracture, acute subdural hemorrhage).	No	Premature baby, delay of physical development, weight difference between twin pair, no support for child rearing from husband, nursing care for biological mother of perpetrator, child-rearing anxiety, depressive tendency.	Penal servitude 3 years, suspended jail term (4 years).
11	M	1 m	Biological mother (29).	Father (29), mother, first-born daughter (5 y), second-born daughter (2 y), male–male twin pair.	Yes	No	Physical maltreatment (hit the back of the victim's head, intracerebral hemorrhage).	Yes (co-twin), no (first and second-born daughter).	Fatigue from child rearing.	Penal servitude 3 years, suspended jail term (5 years) with protective observation.
12 13	M M	7 m	Biological father (24).	Father, mother (21), first-born daughter (3 y), first-born son (2 y), male–male twin pair (two children from former marriage of mother).	No	Yes	Neglect (overheating death in a parked car).	Yes (all four children died))	Divorce and second marriage of mother, teenage pregnancy, low ability to make living.	No information.
14	F	6 m	Biological mother (36).	Father (34), mother, female–female twin pair.	Yes	No	Physical maltreatment (traumatic intradural hematoma, shaken baby syndrome).	No	Fertility treatment and fetal reduction, fatigue from child rearing, child-rearing anxiety.	Penal servitude 3 years, suspended jail term (4 years).

Note: ID number was assigned per child according to national reports.
M = Male; F = Female; y = year; m = month; PTSD = post-traumatic stress disorder.

TABLE 2
Characteristics of Victims and Perpetrators

	Twins (N = 14 from 13 families)		Singletons (N = 423 from 391 families)		Total ^a (N = 437 from 404 families)	Statistical test ^b	
	N	%	N	%	N		
Twin individual							
Sex of victim (per child)							
	Male	7	50	218	52	225	ns
	Female	7	50	192	45	199	
	Unknown	0	0	13	3	13	
Age of victim (per child)							
	<1 year	8	57	185	44	193	ns
	1 year ≤	6	43	231	55	237	
	0 month	0	0	89	48	89	p < .01
	1–11 months	8	100	96	52	104	
	Missing values	0	0	7	2	7	
Main perpetrator (per child)							
	Mother	7	50	226	53	233	ns
	Father	3	21	70	17	73	
	Mother and father	3	21	29	7	32	
	Others	1	7	84	20	85	
	Missing values	0	0	14	3	14	
Age of mother (per mother, years) ^c							
	≤19	0	0	25	9	25	ns
	20–24	4	31	62	23	66	
	25–29	4	31	57	21	61	
	30–34	2	15	47	18	49	
	35–39	1	8	42	16	43	
	≥40	1	8	22	8	23	
	Missing values/no mother	1	8	13	5	14	
	Not reported			123		123	
Age of father (per father years) ^c							
	≤19	0	0	7	3	7	ns
	20–24	2	15	22	8	24	
	25–29	3	23	33	12	36	
	30–34	3	23	42	16	45	
	35–39	1	8	24	9	25	
	≥40	1	8	35	13	36	
	Missing values/no father	3	23	105	39	108	
	Not reported			123		123	
Number of child/children in one family ^d							
	1	0	0	232	39	232	p < .01
	2	5	33	193	33	198	
	3	6	40	72	12	78	
	4 or more	4	27	41	7	45	
	Missing values	0	0	51	9	51	
	Not reported			24		24	
Psychological problem of mother ^{e,f} (per mother, multiple answers allowed)							
	Child-rearing anxiety	5	38	81	25	86	ns
	Impulsiveness	2	15	36	11	38	
	Depressive tendency	2	15	34	11	36	
	Mental disorder	2	15	27	8	29	
	Low ability of child rearing	4	31	77	24	81	
	No mother	1	8	14	4	15	
Marriage status of rearer ^e (per family)							
	Biological parents	7	54	142	45	149	ns
	Divorce	1	8	33	10	34	
	Common-law or second marriage	3	23	58	18	61	
	Others	2	15	46	14	48	
	Missing values	0	0	40	13	40	
	Not reported			72		72	
Main method of maltreatment (per child)							
	Physical maltreatment	9	64	286	68	295	ns
	Neglect	5	36	110	26	115	
	Others	0	0	1	0	1	
	Missing values	0	0	26	6	26	
Maltreatment for other brothers/sisters ^{e,g} (Per sibling)							
	Yes	9	31	59	26	68	ns
	No	14	48	48	22	62	
	Missing values	6	21	116	52	122	
Occupation of mother (per mother) ^e							
	Yes	3	23	68	21	71	ns
	No	8	62	146	46	154	
	Missing values	2	15	105	33	107	
	Not reported			72		72	
Occupation of father (per father) ^e							
	Yes	6	46	107	34	113	ns
	No	4	31	22	7	26	
	Missing value/fatherless family	3	23	190	60	193	
	Missing values			72		72	

TABLE 2
Continued

		Twins (N = 14 from 13 families)		Singletons (N = 423 from 391 families)		Total ^a (N = 437 from 404 families)	Statistical test ^b
		N	%	N	%	N	
Twin pair							Population rate (%)
Sex-combination of twin pair	Opposite-sex	6	46			23–71	
	Same-sex	7	54			29–77	
	Male–male	5					
	Female–female	2					
Sex of twins (per twin individual)	Male of opposite-sex	1	7			1–31	
	Female of opposite-sex	5	36			16–61	
	Male of same-sex	6	43			21–67	
	Female of same-sex	2	14			4–40	
Parity	Primipara	5	38			19–68	
	Multipara	7	54			32–81	
	Missing values	1	8				
Pair-wise concordance rate	Both twins maltreated	6	46			25–75	
	One twin maltreated	6	46			25–75	
	Missing values	1	8				

Note: ^aThe total number of children was based on the national annual reports on fatal child maltreatment presented by the Ministry of Health, Labor and Welfare of Japan (in Japanese).
^bMissing values were excluded in the statistical tests.
^cFourth report and after.
^dSecond report and after. The number includes parent–child murder–suicide.
^eThird report and after.
^fThe denominator was 322 regarding mothers of singletons.
^gNot necessarily fatal maltreatment. Regarding ID 12 and 13, one twin was treated as proband.

prevalence of fatal child maltreatment observed in the same dataset (Ooki, 2013) support this point.

In the case of ID-14, the mother, aged 36 years, was primipara and had used assisted reproductive technology and fetal reduction. Recently, assisted reproductive technology has become one of the typical contexts of families with multiples in Japan (Ooki, 2011). Given this fact, candidates for assisted reproductive technology should receive pre-treatment counseling informing them of the frequency of multiple births and to help them assess their readiness for multiple-birth child rearing.

It was suggested that in the case of families with multiples, the physical, mental, and social overburden of child rearing (Bryan et al., 1997; Denton, 2005) in general rather than factors specific to multiples might be one of the risk factors for child maltreatment.

Risk Factor of Maltreatment as a Twin Pair

Previous hospital-based (as opposed to population-based) studies have found that in twin pairs, both twins tend to be maltreated on one level or another (mild, moderate, and severe). Both twins in three out of five pairs (Groothuis et al., 1982) and in six out of 10 pairs (Nelson & Martin, 1985) were found to be maltreated. This tendency, however, was not specific to multiples, as about half of the siblings of index singletons were also maltreated, as shown in Table 2. According to a recent epidemiologic study by Lindberg et al. (2012), which examined physically abused

children with serious injuries, twins were at substantially increased risk of abusive fracture in comparison to non-twin victims, although this study did not present information on the pair-wise concordance/discordance of twins.

On the other hand, according to Tanimura et al. (1990), only four pairs of both twins out of 21 pairs (19%) were maltreated, indicating that one rather than both of a pair of twins was more likely to be maltreated in Japan. The present results did not support this indication. The difference of present study and that by Tanimura et al. (1990) was that the present study included at least one fatal case in all 13 pairs.

Tanimura et al. (1990) also reported that whether one or both twins were maltreated was influenced by different underlying factors. Maltreatment of both twins occurred when the maltreating parent had psychosocial problems or when the family was beset by serious socioeconomic difficulties. If only one twin in a pair was maltreated, i.e., only one member, he/she, was maltreated, then there seemed to have problems relating to child rearing. The present result was in good accordance with this finding.

One specific feature related to the rearing of twins is the comparison of growth and development of two children of the same age in the same family. This comparison sometimes imparts complicated stress, anxiety, irritation, and a sense of guilt to parents, especially to the mother (Bryan et al., 1997; Denton, 2005). In these cases, the delayed child tends to be the one who is maltreated. On the other hand,

in the case of ID-2, the normal twin with a disabled co-twin was maltreated because the victim could not live up to the mother's (over)expectations. Thus, in such cases the mental condition of the mother was a complicating factor.

There have been no vital statistics showing the precise percentage of opposite-sex pairs among total twin pairs. It has been estimated that about one-third of all twin pairs in Japan are opposite-sex pairs, as two-thirds of all pairs are estimated to be dizygotic (Ooki, 2011). The present rate of female victims of opposite-sex pairs (0.36, 95% CI = 0.16–0.61) and male victims of the same-sex pairs (0.43, 95% CI = 0.21–0.67) seemed high in relation to the approximate percentage of female twins of opposite-sex pairs or male twins of the same-sex pairs in the general twin population (both equal to $1/6 = 0.17$); the reasons for these higher percentages are unclear.

Sentence for Fatal Maltreatment

According to a recent Japanese study by Nambu et al. (2011), the sentences handed down by the court clearly tended to be more lenient for female offenders of fatal child maltreatment. They noted that the only case with a suspended sentence out of 24 cases of fatal child maltreatment from January 2008 to December 2009 was that of the mother of twins (ID-10 of the present study). This may be due to the popular belief that men are partly responsible for any misconduct committed by their wives (Nambu et al., 2011). The present result suggested that this tendency might be especially noticeable in the case of mothers as a solitary murderer of multiples, possibly due to the consideration of severe conditions faced by such mothers.

Case Reports

A few case reports are available that describe the methods used to abuse multiples (Dhanani et al., 2006). Of these, SBS (Becker et al., 1998; Hansen, 1994; Talvik et al., 2008), cervical spine injury (Rooks et al., 1998), and Munchausen syndrome (Lee, 1979) have been reported. Becker et al. (1998) reported five twins severely affected by SBS among four pairs of twins. According to their discussion, twin status could influence the quality of some psychological aspects of victimizing parent(s); a related factor promoting the formation of a stressful situation and familial dysfunction was parents' social isolation, resulting from the increased demands of time and energy involved in caring of twins. More recently, Talvik et al. (2008) studied the relationship between SBS and a typical pattern of babies' crying behavior in two tertiary centers for children in Estonia. In their report, four children out of 26 cases of SBS in Estonia were twins (15.4%), a much higher percentage compared to the general twin frequency in the country (2.1%). They found that the time curve of crying (minutes crying per day according to age in weeks) was similar to the curve of the incidence of SBS cases (number of SBS children according to age in weeks), which both reached their peak at 6 or 7

weeks. They concluded that families with twins are at additional risk for SBS and that parental complaints of excessive crying of their infants should be taken as a signal that they need careful counseling. According to Rooks et al. (1998), the likely mechanism of the cervical spine injury of their two cases of twins was a severe hyperflexion compression insult from violent shaking.

According to the computerized medical literature research by Becker et al. (1998), two case reports (Showers, 1992; Spaide, 1987) on twins with SBS were found, but the authors attached no special value to the victims' status as multiples. Although these reports suggested that the prevalence of SBS in maltreated twins/multiples might be higher than that of singletons, no epidemiologic evidence was reported. In the present study, one fatality ($1/14 = 7\%$) was caused by SBS. The sixth annual report, which represented all fatal maltreatment of children from 0 to 17 years of age between April 2008 and March 2009 in Japan, presented the total number of deaths from SBS. According to this report, SBS as a cause of death in maltreated cases under 3 years of age was 1% ($=1/86$). Compared with the present study, this figure suggests a higher prevalence of SBS in fatal child maltreatment of multiples. Further study is needed on this relationship as well as further research on the crying patterns of multiples in general.

Limitations

The limitations of the present study can be attributed to the data collection itself. First, although all 14 victims counted in the annual reports were identified, the author could not ascertain directly whether these cases were indeed the ones represented in the annual reports. Second, although the present dataset was from a multi-year nationwide survey, it still did not have sufficiently high statistical power to detect statistical significance. The present results might be strongly influenced by chance factors.

Conclusion

Recent Japanese nationwide data and case reports suggest that in the case of child maltreatment in families with multiple births, the non-specific overburden of child rearing might be one possible risk factor, and parental comparisons between twins might be another. Among fatal maltreatment cases, 0-month victims were rare and the number of children per family was larger. The penal sentence for fatal child maltreatment of twins might be more lenient compared with that for singletons.

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Conflicts of interest

None.

References

- Becker, J. C., Liersch, R., Tautz, C., Schlueter, B., & Andler, W. (1998). Shaken baby syndrome: Report on four pairs of twins. *Child Abuse & Neglect*, *22*, 931–937.
- Bryan, E., Denton, J., & Hallett, F. (1997). *Guidelines for professionals: Multiple pregnancy*. London: Multiple Births Foundation.
- Denton, J. (2005). Twins and more — 2. Practical aspects of parenting in the early years. *The Journal of Family Health Care*, *15*, 173–176.
- Dhanani, R. M., Nield, L. S., & Ogershok, P. R. (2006). Traumatized twins: A case report and discussion of the maltreatment of multiples. *Clinical Pediatrics*, *45*, 173–176.
- Groothuis, J. R., Altemeier, W. A., Robarge, J. P., O'Connor, S., Sandler, H., Vietze, P., & Lustig, J. V. (1982). Increased child abuse in families with twins. *Pediatrics*, *70*, 769–773.
- Hansen, K. K. (1994). Twins and child abuse. *Archives of Pediatrics & Adolescent Medicine*, *148*, 1345–1346.
- Lee, D. A. (1979). Munchausen syndrome by proxy in twins. *Archives of Disease in Childhood*, *54*, 646–647.
- Lindberg, D. M., Shapiro, R. A., Laskey, A. L., Pallin, D. J., Blood, E. A., & Berger, R. P. (2012). Prevalence of abusive injuries in siblings and household contacts of physically abused children. *Pediatrics*, *130*, 193–201.
- Nambu, S., Nasu, A., Nishimura, S., Nishimura, A., & Fujiwara, S. (2011). Fatal child abuse in Japan: Does a trend exist toward tougher sentencing? *Journal of Injury & Violence Research*, *3*, 74–79.
- Nelson, H. B., & Martin, C. A. (1985). Increased child abuse in twins. *Child Abuse & Neglect*, *9*, 501–505.
- Ooki, S. (2011). Estimation of the contribution of assisted and non-assisted reproductive technology fertility treatments to multiple births during the past 30 years in Japan: 1979–2008. *Twin Research and Human Genetics*, *14*, 476–483.
- Ooki, S. (2013). Fatal child maltreatment associated with multiple births in Japan: Nationwide data between July 2003 and March 2011. *Environmental Health and Preventive Medicine*. doi:10.1007/s12199-013-0335-9
- Robarge, J. P., Reynolds, Z. B., & Groothuis, J. R. (1982). Increased child abuse in families with twins. *Research in Nursing & Health*, *5*, 199–203.
- Rooks, V. J., Sisler, C., & Burton, B. (1998). Cervical spine injury in child abuse: Report of two cases. *Pediatric Radiology*, *28*, 193–195.
- Showers, J. (1992). Shaken baby syndrome. The problem and a model for prevention. *Children Today*, *21*, 34–37.
- Spaide, R. F. (1987). Shaken baby syndrome. Ocular and computed tomographic findings. *Journal of Clinical Neuro-Ophthalmology*, *7*, 108–111.
- Talvik, I., Alexander, R. C., & Talvik, T. (2008). Shaken baby syndrome and a baby's cry. *Acta Paediatrica*, *97*, 782–785.
- Tanimura, M., Matsui, I., & Kobayashi, N. (1990). Child abuse of one of a pair of twins in Japan. *Lancet*, *336*, 1298–1299.