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Vulnerable Child Syndrome, Parental Perception of Child Vulnerability, and Emergency Department Usage

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Abstract

Background—Vulnerable child syndrome (VCS) describes children perceived to be at risk for behavioral, developmental, or medical problems. Families with the dynamics of VCS overuse health care resources with frequent visits to doctors' offices.

Objective—The objective of the study was to explore the relationship between VCS, parental perception of child vulnerability (PPCV), and frequency of emergency department (ED) visits.

Design/Methods—Parents of patients 1 to 15 years old presenting with nonurgent complaints to a pediatric ED were eligible. Participants completed questionnaires in which the Vulnerable Child Scale was used to generate a measure of PPCV. Primary outcomes included number of ED visits and PPCV assignment. Children were divided into 2 PPCV groups by Vulnerable Child Scale score: less than 40 (high PPCV) versus 40 or greater (low PPCV). The cutoff point was chosen as 1 SD (7.3) from the sample mean (46.8) on the vulnerable end of the scale (low scores).

Results—The mean ages of the 351 parents and children were 30 (SD, 7.7) years and 5 (SD, 3.9) years, respectively; 17% of children had high PPCV. Eleven variables differed statistically between subjects with high and low PPCV including number of ED visits and hospital admissions, excellent reported child health, pregnancy problems, delivery problems, child mental health problems, parent mental health problems, and child developmental problems.

Conclusions—Our results reveal that children with higher PPCV had an increased number of ED visits, and risk factors for higher perceived vulnerability scores were identified. Future investigation on ways to intervene with families with the dynamics of VCS may be warranted.

Keywords

vulnerable child syndrome; parental perception of child vulnerability; health care utilization

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The vulnerable child syndrome (VCS) was first identified in 1964 by Green and Solnit¹ in a report about healthy children with histories of life-threatening illness and subsequent expectations on the parts of their parents that the children would die earlier in life because of their illness. It was found that, years after recovery from the illnesses, these children displayed a variety of symptoms, including abdominal pain, tantrums, sleep difficulties, headaches, and school problems. All of the presenting symptoms were thought to be related to problems in the parent-child relationship resulting from the parents' reaction to their child's previous life-threatening illness.¹ Green and Solnit¹ hypothesized that parental reactions to an acute, life-threatening illness in a child may have long-term psychologically deleterious effects on both parent and child. Risk factors for VCS include a history of infertility, miscarriage, or illness during pregnancy^{1,2}; low birth weight and prematurity³; early illness or other threat to the child's health; and hospitalization during the first year of life.⁴ Maternal risk factors for having children with VCS include mothers who are "worriers," have poor social support, and display obsessive-compulsive behaviors, anxiety, and somatization.^{3,5-8}

Families with dynamics consistent with VCS have excessive concerns about the health of the child. This results in overuse of health care services, with frequent primary care or urgent care visits and "doctor shopping" in an attempt to ward off further illnesses or to seek reassurance that the child is healthy.^{3,9} The pediatric emergency department (ED), with 24-hour availability of emergency and subspecialty services, is often the only access to health care for a family.^{10,11} Many ED patients are without a regular source of care, and many ED patients have acute health care problems but are not critically ill.¹²⁻¹⁴ To our knowledge, the literature has not addressed the potential role of VCS in prompting ED visits. Because of the short-term relationship inherent to the ED visit, the role of the VCS dynamic is not always apparent. However, if it was recognized that families with VCS traits were frequenting the ED for nonurgent visits, a need for educational interventions would be established. Such interventions would aid families with VCS dynamics in assessing valid reasons for an ED visit, possibly resulting in fewer nonurgent ED visits and greater parental satisfaction with health care providers. Thus, the primary purpose of this study was to explore the relationship between high parental perception of vulnerability and frequency of ED visits. A secondary purpose was to explore risk factors associated with VCS in a pediatric ED population.

METHODS

Study Design and Population

This was a convenience sample-based, self-administered survey of parents or legal guardians of children 1 to 15 years of age who presented to a pediatric ED with one of the following nonurgent triage complaints: headache, vomiting, diarrhea, dizziness, rash, ear pain, eye pain, pink eye, difficulty breathing, wheezing, sore throat, muscle aches, or fatigue. Parents were excluded if their child was triaged into the urgent or critically ill category or if they were non-English speaking. Only 1 parent or legal guardian per family was surveyed, regardless of the number of eligible children, and if a child had multiple visits, the parent was interviewed only once.

All parental subjects provided informed consent. The institutional review board at our institution approved the protocol before study initiation.

Setting

The study was conducted for 8 months starting in October 2005 in the ED of Cincinnati Children's Hospital Medical Center (CCHMC), which is an urban-based, tertiary-care center. The ED has an annual patient census of more than 91,000 visits.

Questionnaire Administration and Content

Eligible parental subjects were identified and approached for potential participation in the study by either the principal investigator or a trained clinical research coordinator. Parental subjects completed a closed-question, self-administered survey with questions assessing sociodemographics and child and parent medical and psychiatric history (Appendix 1). Also completed was the Vulnerable Child Scale, which is a previously developed scale designed to gauge parents' perceptions of child health and the degree of parental perception of child vulnerability (PPCV; Appendix 2). A low scale score indicates high parental perceived vulnerability.^{2,3,8,15} The survey also included questions assessing known risk factors for and consequences of high degrees of perceived child vulnerability such as perceived life-threatening illnesses in the family, difficulty with pregnancy or delivery, frequent use of medical services, school absenteeism, sleep disturbances, behavioral problems, and dissatisfaction with health care services.^{1,2,6,7,15,16}

Statistical Analysis

Sample Size—Sample size calculation was based on our a priori hypothesis that patients with a higher PPCV would have 20% higher number of ED visits when compared with patients with less PPCV. For a 2-sided significance level of 0.05 and power of 80%, we determined that a sample of 350 parental subjects was needed to detect this hypothesized difference between groups.

Data Analysis and CVS Scoring—The primary study measures included both the Vulnerable Child Scale score and numbers of ED visits obtained from our computer database of prior ED visits for each patient to our institution since June 2000. Other data included parents' reports of parent/child health and of risk factors for VCS. Child/parent pairs were deemed either high PPCV or low PPCV, based on their Vulnerable Child Scale scores. A cutoff point between 39 and 40 was chosen as the point 1 SD (7.3) from the sample mean (46.8) on the vulnerable end of the scale (low scores), thus identifying 16.8% of our patients as having a high PPCV. Once a cutoff point was established, patients with high and low PPCV assignments were compared on demographic and parent-recalled medical history variables. Parents' education level and income were scored using ranked categories with numerical assignments. Data were analyzed using SAS, version 8.0 (SAS Institute Inc, Cary, NC). All reported *P* values were 2-tailed, and the α level for all tests was 0.05, unadjusted for multiple tests. The 2 PPCV groups were compared using *t* tests or 2×2 exact tests, as appropriate. Some continuous variables with highly skewed distributions were also tested using nonparametric Wilcoxon tests.

RESULTS

Data from 351 patients with complete data were analyzed. An additional 25 patients had incomplete data and were not used. The mean parent and child ages were 29.7 (SD, 7.7) years and 5.0 (SD, 3.9) years, respectively; 92% and 53 % of the parents and children were female. Fifty-three percent were African American, 44% white, and 3% Hispanic, Asian, or American Indian. Eighty-six percent of parents had a reported annual family income of less than \$35,000.

A score on the Vulnerable Child Scale of less than 40 points identified the high PPCV patients, comprising 16.8% of our sample. Significant differences were found between the high and low PPCV groups as seen in Table 1. (For all *P* values from *t* tests, corresponding Wilcoxon tests provided similar *P* values.) Twelve variables differed statistically at *P* < 0.05 between subjects with high and low PPCV: number of total ED visits (6.1 vs 3.3), number of hospital admissions (2.0 vs 1.4), number of intensive care unit admissions (1.3 vs 1.1), excellent reported child health (16% vs 46%), satisfaction with primary doctor (scale) (6.9 vs 7.7), pregnancy problems (45% vs 28%), delivery problems (49% vs 30%), child medical history (63% vs 31%), child sleep problems (44% vs 15%), child mental health problems (26% vs 8%), parent mental health problems (31% vs 14%), and child developmental problems (26% vs 12%). The 2 groups did not differ significantly on child or parent age, child sex, parent education level, income, or marital status.

DISCUSSION

It is not uncommon for physicians to encounter families whose concerns regarding their child's vulnerability to health or safety issues seem out of proportion to the child's actual health problems.⁶ Parental interpretation of a child's vulnerability spans a spectrum from maximal resiliency to maximal vulnerability.¹⁷ Vulnerable child syndrome occurs when there is discordance between parental and physician perception of the child's true vulnerability along that spectrum, with the parent(s) perceiving that a healthy child is at great risk for medical or developmental problems.^{3,15,17} The Vulnerable Child Scale is a tool for measuring parents' perceptions of their child's vulnerability and parents' general concerns about the health of their child.^{2,3,8,15}

Not all families experiencing health problems with a child develop VCS. Often a predisposing condition or experience predates the illness that prompts the development of VCS.¹ There are many risk factors for the development of the dynamics of VCS: prematurity, previous pregnancy losses, complication of pregnancy or the antenatal period, neonatal jaundice, feeding/crying problems in infancy, history of prior illness/hospitalization of the child, maternal depression/anxiety, parental or family health issues, and decreased social support.^{1,2,6,7,15,16} Consistent with previous research findings, our study identifies risk factors for VCS, which include pregnancy or delivery problems; child sleep difficulties; child medical, developmental, or mental health problems; and parental mental health problems.^{1,2,6,7,15,16}

The identification of families with the dynamics of VCS is important for the ED health care worker for several reasons. Parental reactions to serious illness in a child can have long-term negative effects on both the parent-child relationship and the child's psychosocial development.^{1,7} Parents experience difficulty in setting age-appropriate limits on behavior and in encouraging their child's independence, instead exhibiting overprotection and hypervigilance.^{7,15,18} This results in a disruption of the healthy parent/child dynamic, with resultant behavioral and psychiatric consequences for both the child and the parent. Children may react to the parents' fears by either assuming the "sick role" or by rebelling with risk-taking behaviors.^{1,2,17} Children perceived as vulnerable are more likely to have behavior problems such as exaggerated separation anxiety, aggressive/out-of-control behavior, sleep difficulties, and social difficulties, secondary to the lack of appropriate limit setting.^{8,16-21} Children viewed as vulnerable may also experience underachievement in school and increased absences.^{17,19,20,22} These children are at greater risk for hypochondriacal complaints and somatization, thus consuming a disproportionate share of health care resources.^{7,15,16,19-24} Doctor shopping, ED usage, subspecialist consultation, and frequent doctor visits occur. Often the visits occur in expensive hospital-based emergency services and clinics.²⁴ Families with "vulnerable" children also report less satisfaction with care received, as these families often feel that their concerns are not addressed.²⁴ Our findings are consistent with the hypothesis that families with higher PPCV make greater use of emergency services; specifically, we found 6.1 prior ED visits in children with high PPCV compared with 3.3 in those with low PPCV.

Vulnerable child syndrome, with its signature parental perceptions of increased vulnerability, should be expected to increase in prevalence because of advances in medicine such as improved childhood cancer survival and improved trauma outcomes, as well as advances in infertility treatments, perinatology, and neonatology.² With increased survival rates for very premature infants, a population of children at risk for VCS is created.^{2,7,15} In addition, prenatal diagnosis and genetic testing give parents more information about known and potential disorders in their children.² We know from studies surrounding neonatal jaundice, minor head trauma, innocent heart murmurs, phenyl-ketouria testing, and sickle cell screening that there is significant morbidity surrounding even minor early childhood issues and even "nondisease."^{18,21,25-30} With each of these patient groups come families at risk for anxiety and perceptions of child vulnerability. Pediatric ED health care providers should be attuned to signs that parents are experiencing anxiety and seeking health care in an attempt to ward off further illness in their child, especially when ED visits for nonurgent complaints occur.

LIMITATIONS

Our study has several limitations. (1) The study population was a convenience sample collected in a Midwestern, tertiary-care, pediatric ED. The majority of participants had a low socioeconomic status, and 92% of parental subjects were women, possibly limiting the generalizability of our results. In addition, the age range of our children, 1 to 15 years, was broad, as were the associated developmental stages, parental concerns, and medical histories. This broad range may have resulted in differing parental perceptions of child vulnerability. (2) Parental recall bias of both their child's and their own medical and

psychiatric histories may have caused parents to underestimate or especially overestimate reported risk factors for VCS. (3) Only ED visits to our CCHMC ED were included in number of ED visits; visits to other EDs were not captured. However, CCHMC is an urban, tertiary-care center that is the major provider of pediatric care to children living in 8 counties in southern Ohio, northern Kentucky, and southeastern Indiana. The hospital is a center with an annual ED volume of more than 91,000 visits and more than 8000 admissions from the ED. More than 60% of children in the greater Cincinnati area seek emergency care at CCHMC. Thus, it is unlikely that we failed to capture a large number of ED visits.³¹ (4) The baseline mean number of ED visits for our sample was relatively high at 3.8; thus, our sample may have a disproportionately high level of ED use. Similar studies in other pediatric ED settings are thus warranted.

CONCLUSIONS

Despite these limitations, the implications of our investigation are important. This study revealed that children who have high PPCV had an increased number of ED visits for minor illnesses. If health care practitioners working in the ED take a few extra minutes to identify families at risk and preemptively take measures to address anxiety and promote healthy family dynamics,¹⁸ including extra time and care to assess parental expectations and anxiety¹⁵ at the first ED visit, the overall number of ED visits for these families may be decreased, and patient satisfaction may increase. Future investigation of the role of VCS in other ED settings and the development of educational and preventive interventions in families with the dynamics of VCS are warranted in the current family-centered and cost-conscious health care climate.

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APPENDIX 1: Items From the Parent Questionnaire

Parental chronic medical or health problem (yes/no)

Parental chronic mental health problems (yes/no)

- Difficulties involving the pregnancy of the child (yes/no)
- Difficulties involving the delivery of the child (yes/no)
- Prematurity of the child (yes/no)
- Child kept in a special or intensive care nursery at birth (yes/no)
- Child has chronic medical problems (parent-reported) (yes/no)
- Child takes any medications long-term/chronically (yes/no)
- Child takes any medications short-term/occasionally (yes/no)
- Child has experienced any life-threatening illnesses (parent-reported) (yes/no)
- Child sleeps with his/her parents (yes/no)
- Child has sleep difficulties (parent-reported) (yes/no)
- Child has behavioral or mental health difficulties (yes/no)
- Child has developmental difficulties (yes/no)
- Number of parent-reported visits to the private doctor's office in the past year
 0 1-2 2-3 3-4 4-5 5-6 6-7 7-8 8+
- Number of parent-reported calls to the doctor's office in the past year
 0 1-2 2-3 3-4 4-5 5-6 6-7 7-8 8+
- Number of parent-reported visits to emergency rooms/urgent care in the past year
 0 1-2 2-3 3-4 4-5 5-6 6-7 7-8 8+
- Number admissions to the hospital overnight (parent-reported)
 0 1-2 2-3 3-4 4-5 5+
- Number of admissions to the intensive care unit (parent-reported)
 0 1-2 2+
- Number of school days missed in the last year
 0 1-5 5-10 10-15 15-20 20+
- Parental satisfaction with primary doctor's office or clinic (1- to 10-point scale)
- Parental satisfaction with ED or urgent care visits (1- to 10-point scale)

APPENDIX 2: The Vulnerable Child Scale*

1. In general, my child seems less healthy than other children of the same age.
2. I often think about calling the doctor about my child.
3. When there is something going around, my child usually catches it.
4. My child seems to have more accidents and injuries than do other children.
5. My child usually has a healthy appetite.
6. Sometimes I get concerned that my child does not look as healthy as he/she should.
7. My child usually gets stomach pains or other sorts of pains.
8. I often have to keep my child indoors because of health reasons.
9. My child seems to have as much energy as do other children of the same age.
10. My child gets more colds than do other children of the same age.
11. I get concerned about circles under my child's eyes.

12. I often check on my child at night to make sure he/she is OK.
13. I feel anxious about leaving my child with a babysitter or child care.
14. I sometimes am unsure about my ability to care for my child as well as I should.
15. I feel guilty when I have to punish my child.

TABLE 1

Comparisons Between Highly Vulnerable and Less Vulnerable Children Based on VCS Cutoff Point Between 39 and 40

	VCS 40 (Less Vulnerable) (n = 292)	VCS <40 (Highly Vulnerable) (n = 59)	P for Comparison of Groups
No. ED visits	3.3 (2.9)	6.1 (5.6)	0.0005
Child's age	5.0 (3.9)	5.0 (3.8)	1.0
Child male sex	47.6%	44.1%	0.67
Parents' age	29.9 (7.9)	28.7 (6.4)	0.24
Mother's education (scale)	2.8 (1.0)	2.6 (0.9)	0.22
Father's education (scale)	2.5 (1.0)	2.5 (1.1)	0.87
Income (scale)	1.9 (1.2)	1.9 (1.2)	0.66
Parent married	26.0%	20.3%	0.41
White race	43.3%	50.9%	0.31
No. previous hospital admissions	1.4 (0.7)	2.0 (1.4)	0.001
No. previous intensive care unit admissions	1.1 (0.4)	1.3 (0.6)	0.01
Satisfaction with primary doctor (scale)	7.7 (2.5)	6.9 (2.6)	0.02
Satisfaction with ed visit (scale)	7.7 (2.4)	7.0 (3.2)	0.08
Child excellent general health	45.8%	15.5%	<0.0001
Pregnancy problems	28.3%	44.8%	0.02
Delivery problems	29.8%	49.1%	0.006
Previous medical problems	30.7%	62.7%	<0.0001
Sleep problems	14.7%	43.9%	<0.0001
Child mental health problems	8.3%	25.9%	0.0004
Parental psychological problems	13.5%	31.0%	0.003
Child developmental problems	12.3%	25.9%	0.01

Numbers reported are mean (SD) or, for dichotomous factors, percentage. *P* values are 2-tailed and are from *t* tests or, for dichotomous factors, exact tests on 2 × 2 tables.