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ORIGINAL ARTICLE

Epilepsy in children exposed to family and domestic violence in the first 5 years of life

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Aim: To investigate childhood (0–18 years) hospitalisation and emergency department (ED) contacts for epilepsy in Western Australian (WA) children exposed to family and domestic violence (FDV) pre 5 years of age compared to children with no FDV exposure.

Methods: A retrospective, population-based cohort study included children born 1987–2010 who were identified as being exposed to FDV ($n = 7018$) from two sources: WA Police Information Management System and WA Hospital Morbidity Data Collection (HMDC) and a non-exposed comparison group ($n = 41\,996$). Epilepsy contact was identified in HMDC and ED Data Collection records. Cox regression was used to estimate the adjusted and unadjusted hazard ratio and 95% confidence interval (CI) for epilepsy contact; adjustment was made for a range of demographic characteristics known to impact health outcomes. Analyses were stratified by Aboriginal and Torres Strait Islander status to account for higher rates of FDV and epilepsy hospital admissions in Aboriginal and Torres Strait Islander children.

Results: Children exposed to FDV had a 62% (HR 1.62, 95% CI: 1.33–1.98) increased risk of epilepsy contact than non-exposed counterparts. Furthermore, the children exposed to FDV had a 50% longer average hospital stay for epilepsy than non-exposed children (4.7 days vs. 3 days, $P = 0.006$). When stratified by Aboriginal status, we found that Aboriginal children exposed to FDV stayed (on average) 2 days longer in hospital for epilepsy than their non-exposed counterparts (5.1 days vs. 3.1 days, $P = 0.018$).

Conclusions: FDV exposure in early childhood is associated with increased risk of requiring secondary health care and longer hospital stays for childhood epilepsy.

Key words: Aboriginal; epilepsy; family and domestic violence; linked data; violence exposure.

What is already known on this topic

1 Exposure to family and domestic violence (FDV) in early childhood can impact health outcomes.
2 FDV exposure is one of the most prevalent stressors that children can experience.
3 Animal work has highlighted that exposure to stress in early life may be associated with the development of epilepsy in rodents through alterations of brain structure.

What this paper adds

1 Exposure to FDV before 5 years of age increases the risk of hospital contacts for epilepsy.
2 Aboriginal children exposed to FDV have longer hospital stays for epilepsy than non-exposed Aboriginal children.

Childhood exposure to family and domestic violence (FDV) is associated with deleterious effects on health and social outcomes.[1,2] FDV encompasses intimate partner violence and, for Australian Aboriginal and Torres Strait Islander peoples (hereafter respectfully referred to as Aboriginal), violence between extended kinship ties. While FDV is an encompassing term, it is predominately perpetrated by men against women.[3]

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Within Australia, violence against women perpetrated by a current or former intimate partner is a widespread issue with a lifetime prevalence of almost 25%[4]; many of these women are mothers.

Children's exposure to FDV is not simply a dichotomy of whether the child observed or overheard the violence. The child may not always observe the FDV; the abuse may be psychological and controlling behaviour by the perpetrator and not physically visible to the child, but they are still aware that the abuse is happening. Exposure to FDV is a multidimensional construct which captures a range of experiences including the child witnessing and hearing acts first hand, as well as the effects of living in the aftermath of the incident(s) such as seeing their mother injured or fleeing from their home.[5] Young

children (<6 years old) are a sub-group disproportionately exposed to FDV as they spend more time at home.

Adverse events in childhood, including FDV, are known to be correlated with long-term health impacts.[2,6] FDV exposure is one of the most prevalent stressors that children can experience. Early stress appears to disrupt the hypothalamic–pituitary–adrenal-axis (HPA-axis)[7] and the limbic system.[8,9] Emerging research has highlighted a relationship between exposure to trauma in childhood and alterations in the structure, connectivity, network architecture and functions of certain brain regions.[9] A review of animal model research[10] has also highlighted that exposure to stress in early life may be associated with the development of epilepsy in rodents through alterations of brain structure, electrophysiology, neurotransmitter, and neuroendocrine functions.

Epilepsy is the most frequent chronic neurological condition in childhood.[11] It is a heterogeneous condition with aetiologies including genetics, infection, vascular, neoplasms, toxic exposures and head trauma. Head injury is associated with an increased risk of epilepsy and children exposed to FDV having an increased likelihood of head injury.[12] A recent Australian report[13] highlighted that among children who attended hospital for FDV-related injuries, 25% presented with a head injury.

Despite the emerging literature on stress and its impact on the developing brain and evidence for animal studies, there is a dearth of research on children's exposure to FDV and the association with epilepsy. Our study addresses this gap using the whole population linked administrative data to investigate hospitalisation and emergency department (ED) contacts (hereafter grouped together as 'hospital contacts') for epilepsy in Western Australian (WA) children less than 5 years of age exposed to FDV compared to children with no FDV exposure.

Methods

Study design

This population-based retrospective cohort study used routine data collections from the WA Department of Health and WA Police which were linked by the WA Data Linkage Branch using probabilistic matching with clerical review.[14] De-identified data with encrypted project-specific identifications for each member of the cohort and their mother were supplied to the researchers allowing the datasets to be merged.

Cohort identification

Identification of FDV exposure in children born 1987–2010 was from two sources. Firstly WA Police Information Management System identified FDV (2004–2008), where a male perpetrator was charged for the offence against the child's mother and a domestic relationship flag was present. The criminal offences of interest were murder, attempted murder, physical assault, sexual assault, threatening behaviour and misuse of weapons. The categories were derived using the Australian and New Zealand Standard Offence Classification subdivision level.[15] This identified 15 598 exposed children who were then individually matched 1:3 with children with no maternal DFV in the period 2004–2008. The children were matched by the WA Data Linkage Branch using Midwives Notification System. The children were matched on month of birth, socio-economic status, sex and Aboriginal status.

Second, due to the hidden nature of FDV, we interrogated the 'non-exposed' children's maternal Hospital Morbidity Data Collection (HMDC) records for FDV hospitalisations using International Classification of Disease codes identified in previous research[1] (Table 1). This approach identified 4442 children who had a mother with a FDV-related hospital admission, these children were then moved to the exposed cohort. The exposed cohort was then reduced to children who were exposed 0–5 years, resulting in an exposed cohort of 7018 and non-exposed of 41996 children (Fig. 1).

To capture exposure to FDV, we adopted the taxonomy of Holden[5] who describes 10 categories of exposure ranging from the child being actively involved in the FDV to the child being ostensibly unaware of it. Exposure to FDV was ascertained during the first 5 years of the child's life with FDV exposure counted at any point from birth. While it is possible that a hospital contact preceded FDV exposure recorded in our data, this approach was taken because it is recognised that for many women, FDV is not a one-off occurrence.[16] Therefore, it is unlikely that the available

Table 1 International Classification of Diseases (ICD) Codes identifying FDV

ICD Code	Definition	ICD edition
E960-E969	Homicide and injury purposely inflicted by other persons (E960-E969)	ICD-9-CM†
995.81	Adult physical abuse	ICD-CM9†
V71.5	Observation following alleged rape or seduction Examination of victim or culprit	ICD-CM9†
E980-E989	Injury undetermined whether accidentally or purposely inflicted	ICD-CM9†
V61.1	Counselling for marital and partner problems	ICD-CM9†
T74.1	Physical abuse	ICD-10-AM‡
T74.2	Sexual abuse	ICD-10-AM‡
T74.3	Psychological abuse	ICD-10-AM‡
Z04.4	Examination and observation following alleged rape or seduction Examination of victim or culprit following alleged rape or seduction	ICD-10-AM‡
X85-Y09	Assault	ICD-10-AM‡
Y10-Y34	Event of undetermined intent	ICD-10-AM‡
Z63.0	Problems in relationship with spouse or partner (Discord between partners resulting in severe or prolonged loss of control, in generalisation of hostile or critical feelings or in a persisting atmosphere of severe interpersonal violence (hitting or striking)	ICD-10-AM‡

† ICD-9-CM = International Classification of Diseases 9th Edition. ‡ ICD-10-AM = International Classifications of Disease 10th Edition Australian Modification. FDV, family and domestic violence.

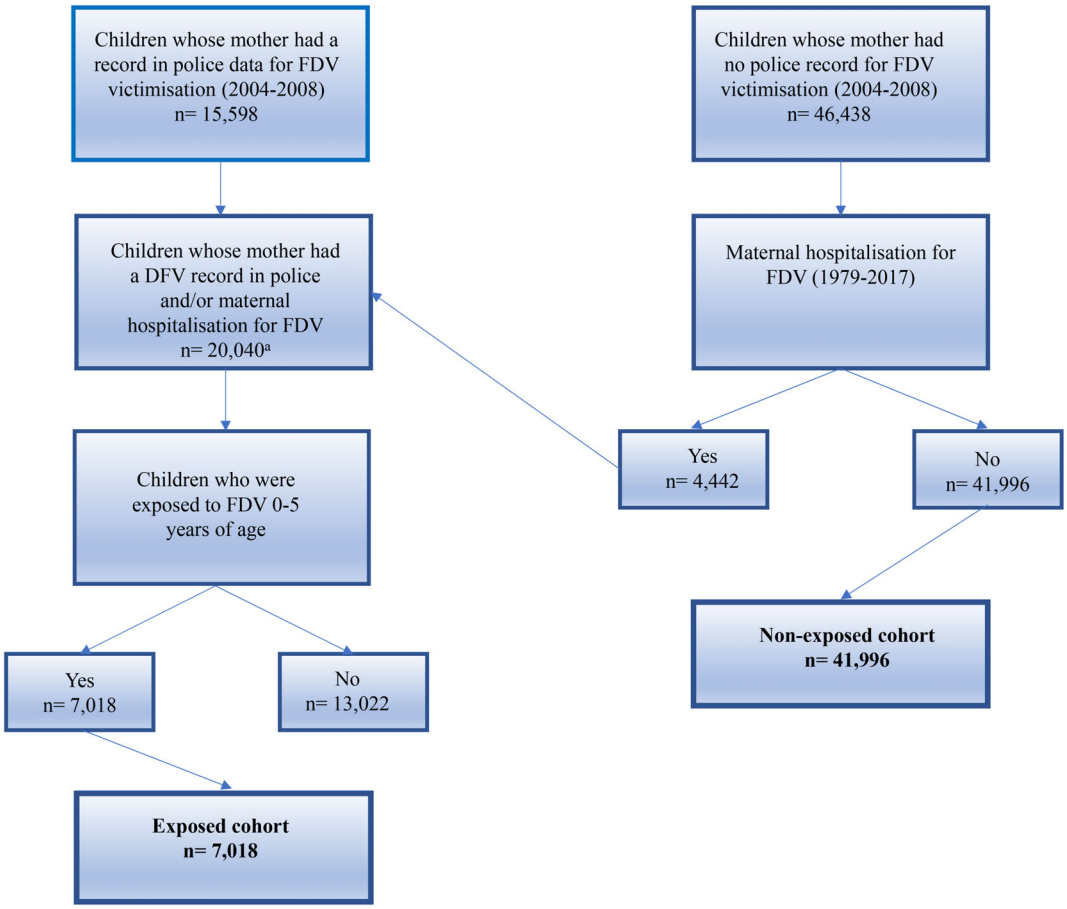

Fig. 1 Cohort selection flowchart. († includes the 4442 children identified in the original cohort of children whose mother had no police record for FDV victimisation (2004–2008) but had a maternal hospitalisation for FDV). FDV, family and domestic violence.

data captures the first incident of FDV. Indeed, previous research[16] highlighted that the majority of children identified as exposed to FDV in middle childhood had their first exposure in their first year of life.

Epilepsy

Epilepsy was identified in the WA HMDC and WA ED data (1987–2016 inclusive) using ICD codes: ICD-9-CM 345 and ICD-10-AM G40. The ICD codes used do not cover febrile convulsions or conversion disorders, that is, seizures caused by fever or psychological conflicts. As epilepsy can be familial, we identified maternal epilepsy in WA HMDC data to be used as a covariable in the statistical modelling (see below). We did not have WA ED data available for mothers.

Traumatic head injury

Traumatic head injury was identified in the WA HMDC and WA ED data for ICD-10-AM codes S00 to S09 used in previous research[13] and the respective ICD-9-CM codes: 925.1 and 521.09.

Demographic variables

Aboriginal children were identified by the WA Data Linkage Branch-derived Aboriginal status flag. The flag is created by a validated algorithm when an individual is recorded as Aboriginal in a range of WA government administrative data sets.[17] Child disability was derived from the WA Register of Developmental Anomalies (WARDA) and the Intellectual Disability Exploring Answers database (IDEA). WARDA is a statutory register, under the WA Health Regulations, it is mandatory for developmental anomalies to be reported. The register contains information on children diagnosed with a developmental anomaly before 6 years of age. The IDEA data set is a record of all WA children with an IQ below 70, or with an observable developmental delay prior to the age of 18. Children are identified and registered on the IDEA data set if they are identified through the WA Government Department of Education, or if they are referred through the Disability Services Commission. Disability was flagged as a yes/no binary, the 'yes' captured children identified as having a disability in either WARDA or IDEA. The child's sex, gestational age, mother's age, father's age and mother's marital status were extracted from the WA Midwives Notification System (MNS) dataset. Neighbourhood-level SES

Table 2 Characteristics of cohort by FDV exposure category

Characteristic	Exposed, n = 7018, *n* (%)	Non-exposed, n = 41 996, *n* (%)
Sex		
Female	3490 (49.7)	20 537 (48.9)
Male	3528 (50.3)	21 459 (51.1)
Aboriginal status†		
Yes	4400 (62.7)	20 919 (49.8)
No	2618 (37.3)	21 077 (50.2)
Socio-economic status†		
1 – *Most disadvantaged*	3690 (52.6)	20 569 (49.0)
2	1503 (21.4)	9549 (22.7)
3	1068 (15.2)	6251 (14.9)
4	515 (7.3)	3867 (9.2)
5 – *Least disadvantaged*	242 (3.5)	1760 (4.2)
Residential remoteness†		
1 – *Highly accessible*	3017 (42.3)	20 261 (48.3)
2	672 (9.6)	4520 (10.8)
3	988 (14.1)	6725 (16.0)
4	915 (13.0)	5190 (12.4)
5 – *Very remote*	1426 (20.3)	5300 (12.6)
Mothers marital status†		
Married/defacto/ widowed	4769 (68.0)	33 300 (79.3)
Never married	1982 (28.2)	7920 (18.9)
Divorced/ separated	190 (2.7)	564 (1.3)
Unknown	77 (1.1)	212 (0.5)
Gestation†		
<37 weeks	1104 (15.7)	4353 (10.4)
37 weeks+	5914 (84.3)	37 634 (89.6)
Mothers age group		
<20	1499 (21.4)	6122 (14.6)
20–29	4061 (57.9)	22 774 (54.2)
30–39	1392 (19.8)	12 478 (29.7)
40+	66 (0.9)	622 (1.5)
Fathers age group†		
<20	486 (6.9)	2260 (5.4)
20–29	2731 (38.9)	16 754 (38.9)
30–39	1506 (21.5)	14 703 (35.0)
40+	313 (4.5)	2829 (6.7)
Missing	1982 (28.2)	5450 (13.0)
Child disability†		
Yes	622 (8.9)	3061 (7.3)
No	6396 (91.1)	38 935 (92.7)
Head injury†		
Yes	1725 (24.6)	7932 (18.9)
No	5293 (75.4)	34 064 (81.1)
Child birth year†		
1987–1992	202 (2.9)	6419 (15.3)
1993–1998	576 (8.2)	9322 (22.2)
1999–2004	3440 (49.0)	13 179 (31.4)
2005–2010	2800 (39.9)	13 076 (31.1)
Maternal epilepsy†		
Yes	44 (0.6)	93 (0.2)
No	6974 (99.4)	41 903 (99.8)
Epilepsy contact†		
Yes	134 (1.9)	474 (1.1)
No	6884 (98.1)	41 522 (98.9)
Average age of first epilepsy contact (months)	57.36 (SD = 51.94)	82.56 (SD = 63.7)
Average age of FDV exposure (months)	27.16 (SD = 17.37)	

† Denotes that $P < 0.001$ for characteristics between exposed and non-exposed children. FDV, family and domestic violence.

was determined by the Socio-Economic Indexes for Areas (SEIFA)[18] using MNS data. The SEIFA score is based on information about income, education, employment, occupation and housing; providing a measure of relative SES for the area where a person resides. Five levels of disadvantage were assigned to census collection districts (~250 households), ranging from 1 (high disadvantage) to 5 (low disadvantage).[18] Residential remoteness was determined by the Accessibility/Remoteness Index of Australia (ARIA) which is based on distance of geographic locations from the nearest population centre, with criteria ranging from major cities to very remote.[19] Residential remoteness was identified in the MNS data from collection district, comprising approximately 250 households.

Data analysis

Descriptive statistics were performed for all cohort characteristics and outcome measures. Pearson's chi-square test was used to assess differences between exposed and non-exposed children for characteristic variables. In addition to descriptive analysis, Cox regression was used to estimate the adjusted and unadjusted hazard ratio (HR) and 95% confidence interval (CI) for the first hospital contact for epilepsy. This was adjusted for by a range of demographic characteristics known to impact health outcomes including: sex, socio-economic status (SES), residential remoteness, mother's marital status, gestation, parental age at child's birth, disability, maternal epilepsy and head injury. Data were censored when the child turned 18 years, or if there was no epilepsy contact by the end of follow-up (end 2016). Cox regression analysis was undertaken to investigate an interaction between head injury and FDV exposure on the epilepsy outcome. Analysis was stratified by Aboriginal status due to Aboriginal children having higher rates of FDV exposure[20] and higher rates of seizure-related hospital admissions than non-Aboriginal Australians.[21] Length of stay was calculated for each child by taking an average of all hospitalisations for epilepsy. All analyses were undertaken using SAS statistical software v9.4.

Table 3 Crude and adjusted hazard ratios (HRs) of hospital contact for epilepsy in children 0–18 years

Characteristic	Crude HR (95% CI)	Adjusted† HR (95% CI)
Sex		
Female	reference group	reference group
Male	1.10 (0.93–1.29)	0.91 (0.78–1.07)
Aboriginal status		
Yes	1.50 (1.28–1.77)	1.54 (1.27–1.87)
No	reference group	reference group
Socio-economic status		
1 – *Most disadvantaged*	0.91 (0.62–1.32)	0.84 (0.57–1.25)
2	0.84 (0.56–1.25)	0.78 (0.52–1.16)
3	0.77 (0.50–1.17)	0.72 (0.47–1.11)
4	0.57 (0.35–0.93)	0.55 (0.34–0.90)
5 – *Least disadvantaged*	reference group	reference group
Residential remoteness		
1 – *Highly accessible*	reference group	reference group
2	0.71(0.58–1.27)	0.86 (0.65–1.15)
3	0.78(0.61–0.98)	0.83 (0.65–1.06)
4	0.72(0.55–0.94)	0.70 (0.53–0.93)
5 – *Very remote*	0.80 (0.63–1.03)	0.70 (0.53–0.91)
Mother's marital status		
Married/defacto/ widowed	reference group	reference group
Never married	1.57 (1.32–1.88)	1.27 (1.03–1.56)
Divorced/separated	1.91 (1.14–3.20)	1.47 (0.87–2.48)
Unknown	1.08 (0.35–3.35)	0.74 (0.24–2.31)
Gestation		
<37 weeks	1.65 (1.34–2.04)	1.14 (0.92–1.42)
37 weeks+	reference group	reference group
Mothers age group		
<20	1.26 (0.99–1.60)	1.03 (0.76–1.40)
20–29	0.94 (0.78–1.14)	0.87 (0.70–1.09)
30–39	reference group	reference group
40+	2.34 (1.44–3.81)	2.46 (1.48–4.09)
Father's age group		
<20	1.30 (0.93–1.81)	0.88 (0.59–1.32)
20–29	0.96 (0.79–1.16)	0.88(0.70–1.10)
30–39	reference group	reference group
40+	0.96 (0.67–1.38)	0.75 (0.51–1.10)
Missing	1.24 (0.98–1.56)	0.79 (0.60–1.04)
Child disability		
Yes	6.11 (5.16–7.23)	5.74 (4.83–6.82)
No	reference group	reference group
Maternal epilepsy		
Yes	1.66 (0.53–5.15)	1.06 (0.34–3.32)
No	reference group	reference group
Head injury		
Yes	2.29 (1.94–2.71)	2.00 (1.69–2.38)
No	reference group	reference group
FDV exposure 0–5 years		
Yes	1.88 (1.55–2.28)	1.62 (1.33–1.98)
No	reference group	reference group

† Adjusted for all characteristics in the table. CI, confidence interval; FDV, family and domestic violence.

Table 4 Adjusted hazard ratios (HRs) of hospital contact for epilepsy in children (0–18 years) stratified by Aboriginal status

	Non-Aboriginal	Aboriginal
Characteristic	Adjusted† HR (95% CI)	Adjusted† HR (95% CI)
Sex		
Female	reference group	reference group
Male	0.94 (0.73–1.23)	0.89 (0.73–1.10)
Socio-economic status		
1 – *Most disadvantaged*	1.01 (0.58–1.77)	0.60 (0.35–1.05)
2	0.87 (0.49–1.55)	0.58 (0.33–1.03)
3	0.79 (0.43–1.44)	0.57 (0.31–1.0)
4	0.81 (0.43–1.54)	0.28 (0.13–0.62)
5 – *Least disadvantaged*	reference group	reference group
Residential remoteness		
1 – *Highly accessible*	reference group	reference group
2	1.05 (0.72–1.55)	0.67 (0.43–1.03)
3	0.84 (0.55–1.29)	0.81 (0.59–1.10)
4	1.18 (0.66–2.08)	0.60 (0.44–0.83)
5 – *Very remote*	1.20 (0.49–2.93)	0.66 (0.49–0.88)
Mothers marital status		
Married/defacto/ widowed	reference group	reference group
Never married	1.52 (1.01–2.29)	1.16 (0.92–1.47)
Divorced/separated	1.23 (0.45–3.37)	1.53 (0.83–2.82)
Unknown	‡	0.89 (0.28–2.78)
Gestation		
<37 weeks	1.27 (0.86–1.86)	1.10 (0.85–1.44)
37 weeks+	reference group	reference group
Mothers age group		
<20	1.08 (0.60–1.95)	1.05 (0.72–1.51)
20–29	0.81 (0.58–1.12)	0.90 (0.67–1.20)
30–39	reference group	reference group
40+	2.67 (1.38–5.17)	2.16 (0.97–4.81)
Fathers age group		
<20	0.78 (0.30–2.03)	0.81 (0.51–1.28)
20–29	1.06 (0.75–1.48)	0.74 (0.55–0.99)
30–39	reference group	reference group
40+	0.82 (0.50–1.35)	0.67 (0.37–1.20)
Missing	1.07 (0.58–1.97)	0.70 (0.51–0.96)
Child disability		
Yes	6.69 (5.08–8.79)	5.20 (4.16–6.51)
No	reference group	reference group
Maternal epilepsy		
Yes	1.71 (0.24–12.29)	0.84 (0.21–3.40)
No	reference group	reference group
Head injury		
Yes	1.63 (1.22–2.19)	2.26 (1.82–2.80)
No	reference group	reference group
FDV exposure		
Yes	1.68 (1.18–2.39)	1.59 (1.25–2.03)
No	reference group	reference group

† Adjusted for all characteristics in the table. ‡ Cell count too small to report. CI, confidence interval; FDV, family and domestic violence.

Ethics

Ethics approval for this study was obtained from the WA Department of Health Human Research Ethics Committee (#2016/60), the WA Aboriginal Health Ethics Committee (#756) and the University of Western Australia Human Research Ethics Committee (#RA/4/1/8867).

Results

Table 2 displays the characteristics of the cohort, stratified by exposure to FDV. Compared to children not exposed to FDV, exposed children had a greater proportion of being Aboriginal (62.7% vs. 49.8%, $P < 0.001$), being born to a teen mother (21.4% vs. 14.6%, $P < 0.001$) and be premature (15.7% vs. 10.4%, $P < 0.001$).

Before adjusting for child, family, and neighbourhood characteristics, children exposed to FDV pre 5 years had an 88% increased risk of having a hospital contact for epilepsy, compared to non-exposed children (HR: 1.88, 95% CI: 1.55–2.28) (Table 3). After adjustment, the HR was 1.62 (95% CI: 1.33–1.98) when comparing these groups. Following adjustment, a twofold increased risk of epilepsy contact was seen in children exposed to FDV with a head injury compared to their non-exposed counterparts. The highest risk of epilepsy contact, following adjustment, was seen in children with a disability who were exposed to FDV compared to their non-exposed counterparts (HR: 5.74, 95% CI: 4.83–6.82).

Due to the correlation between FDV and head injury in children exposed to FDV and the increased risk of epilepsy in children with a head injury; analyses were undertaken to investigate an interaction. We did not find a significant interaction ($P = 0.129$) between FDV exposure and head injury on the risk for epilepsy contact in hospital records.

In separate analyses, stratified by Aboriginal status, risk increases were seen in both Aboriginal and non-Aboriginal children exposed to FDV, when compared to non-exposed counterparts (HR: 1.59, 95% CI: 1.25–2.03; HR: 1.68, 95% CI: 1.18–2.39, respectively) (Table 4).

Children exposed to FDV had a 50% longer average hospital stay for epilepsy than non-exposed children (4.7 days vs. 3 days, $P = 0.006$). When stratified by Aboriginal status, we found that Aboriginal children exposed to FDV stayed (on average) 2 days longer in hospital for epilepsy than their non-exposed counterparts (5.1 days vs. 3.1 days, $P = 0.018$). For non-Aboriginal children exposed to FDV, the gap in their hospital stay for epilepsy compared to non-exposed counterparts was non-significant (3.6 days vs. 2.7 days, $P = 0.3653$).

Discussion

Our results demonstrate an association between childhood exposure to FDV and increased hospital contact for childhood epilepsy, providing a new insight into the relationship between FDV exposure on children's outcomes.

Exposure to FDV in childhood has been linked to poorer health outcomes in children,[1] one possible explanation for the correlation is the biological response to trauma.[22] It is thought that FDV exposure can challenge the physiological response systems, particularly the HPA-axis.[7] While previous research has noted that HPA-axis hyperactivity is common to epilepsy, it does not prove causality[23] and further research is required. Additionally, previous research has found that some children exposed to early trauma have alterations in electroencephalogram measures of brain activity in anterior frontal cortex and temporal lobe.[24] These alterations may be a potential explanation for increased epilepsy contacts in children exposed to FDV. Given the 62% increased risk of epilepsy in children exposed to FDV, this is an area in need of further research.

Children exposed to FDV may have more hospital contact for epilepsy due to stress, which is the most common patient-reported seizure precipitant.[25] A further seizure trigger is inadequate sleep.[26] Previous research has found increased sleep problems in children exposed to FDV.[27] Additionally, adherence to medication in paediatric epilepsy is low[28] with previous research indicating that poor family functioning can impact medication adherence.[29] Therefore, it is important that clinicians are skilled to enquire about home stressors such as FDV and are aware of appropriate support services for children and their mothers.

Consistent with existing literature,[30] we found that head injury was associated with an increased risk of epilepsy. An interaction between FDV, head injury and risk of epilepsy was investigated; however, this was found to be non-significant. However, our capture of head injury was limited to hospital and ED data, which would under-ascertain the true level of head injury in the cohort, especially those of lower severity that do not lead to hospital or ED contact. Children exposed to FDV are more likely to experience physical maltreatment[31] and, as such, parents may not seek medical treatment for head injuries due to concern of child protection involvement. Further research which includes wider capture of head injury, such as survey data and primary care data, is required to investigate this relationship more thoroughly.

Aboriginal children exposed to FDV were more likely to have longer lengths of hospital stay for epilepsy than non-Aboriginal children exposed to FDV, by an average of one and a half days. A possible explanation for the longer stay may be due to the higher proportion of Aboriginal children in our cohort living in very remote areas than non-Aboriginal children. Remote locations are reliant on small health centres, general practices, and community-controlled services where staff tend to be generalists which may hamper a child's discharge if they require specialist follow-up care.

Children with a disability had the highest risk of hospital contact for epilepsy in our analysis. This finding aligns with previous research that found rates of epilepsy in people with disabilities to be much greater than the general population.[32]

Although addressed where possible, there are some limitations in this study. We were only able to capture FDV in hospital and police data, where a mother was hospitalised or a male with a domestic relationship was charged with an FDV offence. Therefore, our data are an underestimation of the true level of FDV in the population. However, the data do likely capture the more severe end of the FDV spectrum that requires police intervention or hospital contact. We likely have not captured all childhood epilepsy as our records were restricted to ED and HMDC data. Epilepsy could have occurred prior to the first recorded exposure of FDV. FDV exposure was restricted to 0–5 years.

Conclusion

In conclusion, exposure to FDV in early childhood is associated with increased risk of childhood epilepsy requiring secondary health care and longer hospital stays for epilepsy-related admissions. FDV is preventable and priority should be directed towards the primary prevention of violence and support for women and families affected. For children exposed to FDV early intervention is required to reduce the long-term harm both physical and psychological.

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