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REVIEW

Ocular Injuries and Intimate Partner Violence: A Review of the Literature

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Purpose of Review: Intimate partner violence (IPV) is a leading cause of death and disability across the world. We sought to investigate the prevalence and clinical presentation of ocular injuries in IPV.

Recent Findings: Literature review revealed 16 published studies that evaluated ocular injuries in IPV, of which the study types included 9 retrospective studies, 2 prospective, 1 review, 1 invited commentary, 2 case reports, and 1 population-based cross-sectional survey. These studies suggest that 45% of IPV incidents involve ocular injury. Various injury types have been described including traumatic cataract, dislocated lens, retinal detachment, intraocular hemorrhage, orbital and zygomaticomaxillary complex fractures, optic nerve avulsion, and open globe injuries. Implementation of IPV screening programs in various clinical settings, including an emergency department evaluating ocular trauma, suggests a positive association with identification of IPV and improving access to resources.

Summary: Within IPV, ocular injuries are a prevalent and important cause of vision loss. Various injuries have been reported affecting nearly every anatomical region of the eye. Routine screening for IPV among patients that present with ocular injuries and evaluating for visual complaints among patients experiencing IPV are both important. Future work focused on prospective studies and evaluation of screening techniques may be impactful.

Keywords: intimate partner violence, ocular injuries, trauma

Introduction

Intimate partner violence (IPV) is generally defined as any behavior within an intimate relationship, including, but not limited to, a partner, spouse, family member that causes physical, psychological, or sexual harm to those in that relationship.[1] Unfortunately, IPV is a leading cause of death and disability across the world.[2] Approximately one in three women and one in four men will experience IPV in their lifetime in the United States (US), as suggested by a 2010 report by the Centers for Disease Control (CDC).[3]

While certain populations may have a slightly higher association with IPV; in general, IPV is prevalent regardless of nationality, race, ethnicity, religion, or socioeconomic status.[4] Studies demonstrate that in half of female murder cases, the perpetrator was an intimate partner, and homicide rates among women are 15 times more likely to be with someone they know, 62% of whom are wives or girlfriends of the offender.[5,6] Therefore, appropriate identification of IPV can be a life-saving intervention.

Majority of patients who experience IPV have documented visits to an emergency department, thus the detection of IPV within healthcare settings is an important point of intervention.[7] Among patients who experience IPV, the midface is consistently reported as the most commonly involved anatomical site of injury.[8–11] Research suggests that trauma to the head and neck region is present in 88–94% of patients with IPV injuries.[12,13] Therefore, including IPV in the differential diagnosis for individuals who present with head, neck, or facial injuries of unclear etiology is imperative. IPV-related injuries that impact the eye and ocular region are important to identify, as injuries can lead to long-term visual impairment. In this review, we sought to investigate the prevalence and clinical presentation of ocular injuries related to IPV.

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Methods

Published studies were identified by the National Library of Medicine (PubMed) using the terms "Intimate partner violence", "domestic violence", "ocular", "eye", "ophthalmic" and/or "injuries" (most recent on June 2024). All article types were reviewed and included, and additional studies were identified by consulting cited references. Inclusion criteria were studies that specifically pertained to the eye and ocular region. The country of origin of the study was not an exclusion criterion. Studies that focused on the maxillofacial region were not formally included but were reviewed to evaluate if they included data related to orbital fractures.

The literature search yielded 16 published studies[14–29] that evaluated eye or ocular injuries in IPV, including 9 retrospective studies, 2 prospective, 1 review, 1 invited commentary, 2 case reports, and 1 population-based cross-sectional survey (Table 1).

Results

Estimated Prevalence of Ocular Injuries Related to Intimate Partner Violence

A few studies have investigated the rates of ocular injuries and IPV, of which research suggests a high prevalence; approximately 45% of IPV injury incidents involve the eye.[23,30] One study found that among 54 consecutive patients with orbital fractures, one-third of cases in women were related to IPV or sexual assault.[14] A study in Fiji of 1381 adults who suffered ocular trauma found that 28.4% were related to IPV.[18] Another study found that one-third of orbital fracture cases in women were due to IPV.[14] The maxillofacial region is suggested to be injured in over 80% of IPV related trauma, of which research suggests the bony orbit is injured in 20.2% and the zygoma in 16.7% of cases, and the left side is more common, likely related to right handedness of the victim's partner.[31,32]

The rates of ocular injuries among IPV have been evaluated,[20] yet likely are underestimated.[4,16] For example, a study at a large Level I trauma center in the Midwest found that despite one in five cases of orbital trauma having no documented cause, they still found that 7.6% of orbital floor fracture cases were related to IPV.[20] Another study found that IPV was a leading cause among over 400 female patients with orbital fractures, and yet there were very low rates of documented ancillary services among those who had experienced assault; for example, only 8.3% had referral to social service agencies.[20]

Characteristics of Patients with IPV-Related Ocular Injuries

A recently published retrospective cross-sectional study investigated the epidemiologic pattern and injury mechanism of ocular trauma related to IPV.[29] They evaluated the National Trauma Data Bank (NTDB), the largest US hospitalized trauma case database comprising over 900 US facilities.[29] They identified 2598 IPV-related ocular traumas recorded in the NTDB from 2017 to 2018.[29] Among the cases, the mean age was 45.2 years, two-thirds were female, and one-half were white.[29] The insurance status of the cohort included 32.6% of patients on Medicaid, 20.2% on Medicare, 20.2% on private insurance, and self-pay included 18.8%, exemplifying the importance of screening for IPV regardless of perceived socioeconomic status.[29] Another study utilized the national injury surveillance system from 2006 to 2016 and identified 25,541 cases of ocular injury related to IPV, of which 18,748 were in women and 6667 were in men.[28] These studies suggest a higher rate in women, but emphasize that IPV occurs in both men and women.

Types of Ocular Injuries Related to Intimate Partner Violence

Various IPV-related eye injuries have been reported, involving nearly every anatomic region of the eye (Figure 1). Vision threatening injuries include traumatic cataract, retinal detachment, intraocular hemorrhage, orbital and zygomaticomaxillary complex (ZMC) fractures, and open globe injuries (Figure 1).[20,25] One case report described optic nerve avulsion related to IPV[17] and another described a dislocated lens (Figure 1).[19] Overall, the most common injury reported appears to be periorbital contusions and corneal abrasions.[28]

A retrospective study found that among 79 IPV-related injuries seen at a dedicated eye emergency center, the most common diagnoses were periorbital contusion/laceration (76%), subconjunctival hemorrhage (68%), traumatic iritis (34%), and microhyphema (28%).[15] Studies suggest that ZMC fractures occur twice as frequently with IPV-related

Table 1 Literature Describing Ocular Injuries Associated with Intimate Partner Violence (IPV), Including the Year, Author, Title, Study Type and the Total Size of the Study Cohort, Whether the Study Included Men and/or Female Patients and the Number of IPV-Related Incidents in the Study

Year	Author	Title	Study Type	Total n	Sex	IPV n	Results
1995	Hartzell et al[14]	Orbital Fractures in Women due to Sexual Assault and Domestic Violence	Retrospective	54	F/M	6	Among 54 (35 M and 19 F) consecutive orbital fracture cases, 6 cases were due to IPV.
1996	Beck et al[15]	Ocular Injuries in Battered Women	Retrospective	79	F	79	Described IPV related injuries in an eye emergency room (18 definite IPV, 61 suspected)
2000	Goldberg et al[16]	Orbital fractures due to domestic violence: an epidemiologic study	Retrospective, case-control	41	F	3	7.3% of orbital fractures among women were related to IPV, however authors suggest likely underreported
2007	Douat et al[17]	Evulsion of the optic nerve, a diagnosis to be recognised	Case report	1	F	1	Report of optic nerve avulsion related to IPV
2011	Brian[18]	Population-based study of self-reported ocular trauma in Figi	Cross-sectional survey	1381	F/M	27	Among 1381 adults, 247 suffered ocular trauma, of which 27 were related to IPV
2012	Georgalas et al[19]	Management of crystalline lens dislocation into the anterior chamber in a victim of domestic violence	Case report	1	F	1	Report of dislocated lens related to IPV
2014	Clark et al[20]	Intimate Partner Violence: An Underappreciated Etiology of Orbital Floor Fractures	Retrospective	405	F	31	Among 5650 facial fracture patients, there were 405 women with orbital floor fractures at a tertiary care ED, 31/405 (7.6%) due to IPV, note 83/405 no etiology documented
2015	Chowdhury[21]	Injuries in marginal workers and social trauma in female: Important paradigm shift in eye injury over a decade	Prospective	12,365	F/M	1862	Found 1862 (60%) of eye injuries in women were related to "social violence"
2016	Atipo-Tsiba[22]	Ocular Injuries in Female Victims of Domestic Violence in Brazzaville (Congo)	Prospective	15	F	15	Among 15 women admitted for vision threatening IPV eye injuries, open globe represented 40% of cases and orbital floor fracture 26.7%.
2017	Cohen et al[23]	Intimate partner violence in ophthalmology: a global call to action	Review	–	–	–	Summary of IPV in ophthalmology
2017	Grob et al[24]	Intimate Partner Violence: an important etiology to identify in patients with open globe injuries	Retrospective	390	F/M	8	Among 390 open globe cases, 8 cases of open globe injuries related to IPV, 6/9 eyes were NLP after surgical repair

(*Continued*)

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Table 1 (Continued).

Year	Author	Title	Study Type	Total n	Sex	IPV n	Results
2019	Cohen et al[25]	Intimate partner violence as a mechanism of traumatic ocular injury in women	Retrospective	211	F	5	Among 211 female patients with ocular injuries, assault represented 16/190, of which 5 were confirmed IPV-related eye injuries, 4/5 resulted in enucleation. Note: no perpetrator documented 3/16.
2021	Dawoud et al[26]	Detection and Referral of Orbital and Ocular Injuries Associated With Intimate Partner Violence Following an Educational and Screening Initiative in an Emergency Department	Retrospective	216	F	22	Among 216 with orbital floor or ZMC fracture, 22/216 had IPV related injuries. Which was increased compared to pre-initiation 31/405
2021	Slentz et al[27]	Intimate Partner Violence-Related Oculofacial Injuries During the COVID-19 Pandemic	Invited Commentary	–	–	–	Highlights impact of COVID-19 pandemic on IPV injuries
2022	Malhotra et al[28]	Ocular Injuries Caused by Intimate Partner Violence Using an Emergency Room	Retrospective	25,541	F/M	25,541	25,541 emergency room patients with IPV related ocular injury were reviewed
2023	Alik et al[29]	Epidemiologic Pattern and Injury Mechanism of Intimate Partner Violence–Related Ocular Trauma in the US	Retrospective	2598	F/M	2598	Retrospective review of 2589 IPV related ocular trauma revealed 2/3 female, 1/3 on Medicaid, and 1/2 were white

Abbreviations: IPV, intimate partner violence; M, male, F, female, F/M, female and male included.

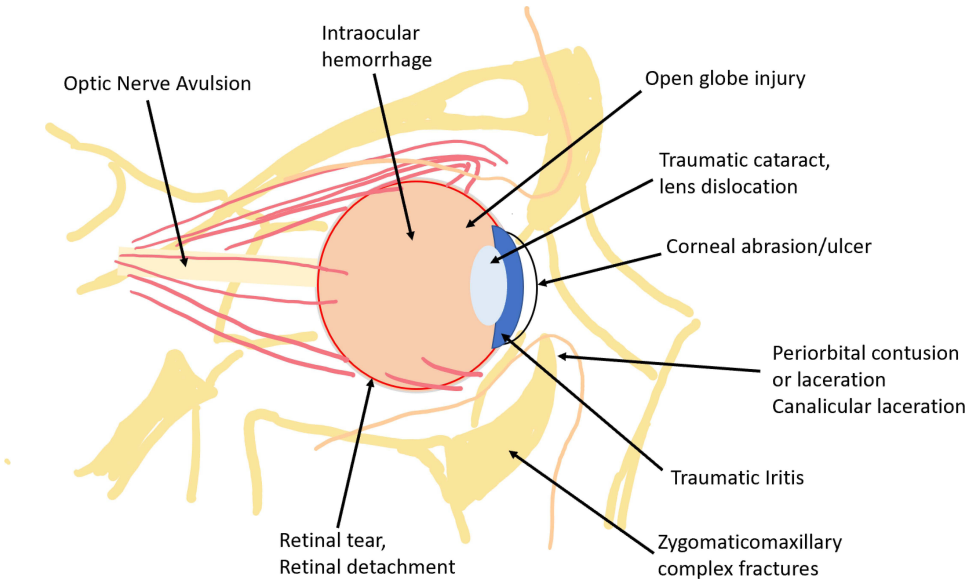

Figure 1 Graphic Illustrating Various Ocular Injuries that have been Associated with Intimate Partner Violence.

assault compared with non-IPV-related violence.[20,25] A ZMC fracture requires substantial force and repeated trauma, thus identification of IPV among these patients can be both vision saving and lifesaving.[27]

Open Globe Injuries and Intimate Partner Violence

Open globe injuries are another severe injury that often causes irreversible blindness.[4,22,24] A retrospective study described ruptured globe in 4% of IPV-related injuries at a dedicated eye emergency department.[15] Another retrospective study found that among IPV-related traumas that led to ocular injuries (n = 16), scleral laceration and ruptured globe occurred in 5 cases of which 4/5 required enucleation.[25,33]

At a major referral center for open globe injuries in the northeast, a retrospective analysis found that among 390 open globe injuries repaired over 3 years, 8 patients reported IPV.[24] One patient presented with bilateral open globe injuries from IPV.[24] Unfortunately, despite surgical repair, 6 of the 8 eyes in the report resulted in no light perception (NLP), or total vision loss.[24]

Interventions to Identify IPV Among Patients with Ocular Injuries

Implementation of an IPV education program and standardized IPV screening at a level 1 trauma center among patients with ruptured globes and facial fractures described a significant increase in social work referrals (55%), home safety assessments (79%), and law enforcement evaluation (50%).[26]

The program included an electronic medical record nursing alert if screening had not been performed for a patient with an orbital floor or ZMC fracture.[26] The screening questions included: (1) have you had abuse or injury in the last year?, (2) have you been forced into a sexual act?, and (3) have you felt unsafe in a relationship?[26] Any positive screen cued an automatic referral to social work.[26] Another part of the intervention was grand rounds by an oculoplastics faculty member and ophthalmology resident on IPV-injury patterns and screening delivered to multiple departments, including ophthalmology, emergency medicine, otolaryngology, and trauma surgery.[26]

Discussion

In this review, we evaluated the literature for studies that investigated eye and ocular injuries associated with IPV; we identified 16 published studies focused on this topic. The current research suggests that ocular injuries related to IPV are highly prevalent; given studies suggest 45% of IPV injuries involve the eye and surrounding ocular structures, and approximately one in three women and one in four men will experience IPV in their lifetime.[3] Annually, 1.6 million

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people lose their sight due to ocular injury in general, thus the long term visual outcomes related to IPV ocular injury are likely significant and underreported.[34]

IPV-related ocular injuries range in presentation and severity, affecting nearly every anatomical region of the eye. Review of the literature suggests that clinicians should consider screening (Box 1) for IPV among patients that present with – from anterior to posterior – ZMC complex fractures, periorbital contusion, laceration, or canalicular laceration, a corneal abrasion or ulcer, traumatic iritis, traumatic cataract, dislocated lens, intraocular hemorrhage, retinal tear, retinal detachment, optic nerve avulsion, or open globe (Figure 1). The poor outcomes of patients with IPV injuries, such as open globes, emphasize that ocular injuries associated with IPV can have devastating consequences on long-term vision, thus it is imperative that consultation of ophthalmology occurs if there is any concern for ocular injuries or visual changes among patients with a history of IPV.

In addition to screening guidelines, clinicians should utilize their intuition and be alert for signs of IPV. A study suggested that signs of IPV-related injury may include patients who are evasive or hesitant to answer questions, have unexplained or poorly explained injury, multiple injuries in various stages of healing, a delay between the time of injury and presentation for treatment, as well as non-compliance with follow-up.[15] When evaluating a patient with a potential IPV-related injury, alternative mechanisms for injury may include falls, motor vehicle crash, non-IPV related assault, unintentional injury with an inanimate object, or animal-associated injuries. Among facial injuries associated with IPV, it is important to screen for cranial injuries as well.[4]

Despite its prevalence, the few published studies reveal that additional research, including prospective studies and qualitative evaluation of IPV screening programs, would be valuable. Vision loss among patients experiencing IPV and survivors of IPV has been associated with depression, reduced mobility, more significant economic burden, decreased independence, and reduced quality of life.[21,35] As with other vulnerable patient populations, limited access to ophthalmic services reduces the timely care that is necessary to prevent permanent vision loss and deformities of the ocular area and surrounding regions.[36–38] For example, a study found that among 956 women who experienced an IPV injury, many felt that the injuries required medical treatment, yet 86% did not receive healthcare for the respective injury.[39] Thus, programs that aim to improve screening and healthcare access for patients with an IPV-related injury are important.

Discrepancy exists regarding recommended screening for IPV. The US Preventive Services Task Force (USPSTF) recommends that clinicians screen for IPV in women of reproductive age during annual office visits as a Grade B recommendation.[40] The American Academy of Family Physicians (AAFP) supports the same screening guideline as a

Box 1 Screening Tools for Intimate Partner Violence

HITS	How often does your partner: (1) Physically hurt you? (2) Insult you or talk down to you? (3) Threaten you with harm? (4) Scream or curse at you?
WAST	In general, how would you describe your relationship—a lot of tension, some tension, no tension?
	Do you and your partner work out arguments with great difficulty, some difficulty, or no difficulty? (response options: often, sometimes, never)
	Do arguments ever result in you feeling down or bad about yourself?
	Do arguments ever result in hitting, kicking, or pushing?
	Do you ever feel frightened by what your partner says or does?
	Has your partner ever abused you physically? Emotionally? Sexually?
PVS	Have you been hit, kicked, punched, or otherwise hurt by someone in the past year? If so, by whom?
	Do you feel safe in your current relationship?
	Is there a partner from a previous relationship who is making you feel unsafe now?
AAS	Have you ever been emotionally or physically abused by your partner or someone important to you?
	Within the last year, have you been hit, slapped, kicked, or otherwise physically hurt by someone? If yes, by whom? How many times?
	Since you have been pregnant, have you been hit, slapped, kicked, or otherwise physically hurt by someone? If yes, by whom? How many times and where?
	In the last year, has anyone forced you to have sexual activities? If so, whom? How many times?
	Are you afraid of your partner or anyone you listed above?

Abbreviations: HITS, Hurt, Insulted, Threatened, Screamed; WAST, Woman Abuse Screening Tool; PVS, Partner Violence Screen; AAS, Abuse Assessment Screen.

Grade A recommendation.[40] The World Health Organization (WHO) recommends screening for IPV only when assessing clinical conditions that are associated with IPV.[40]

Different screening guidelines and tools exist (Box 1) within different healthcare specialties and for certain patient populations, such as pregnant or transgender patients.[41–43] Screening tools also exist for detecting IPV perpetration.[44] The USPSTF found that screening tools with the highest sensitivity and specificity included HITS, OVAT, STaT, HARK, CTQ-SF, and WAST (Box 1).[45] However, many screening tools have only been evaluated in small studies and do not have well-established psychometric properties.[46]

Studies suggest that protocols that aim to improve the referral patterns in IPV-related ocular injuries have an impact. Similar intervention programs in other healthcare settings have been described.[47] Robust evaluation of intervention programs is important; few have been evaluated with randomized controlled trials.[48]

System level changes that improve access to eye care services and local efforts by emergency rooms, clinics, including ophthalmology practices and departments, to screen for IPV among patients and to remain vigilant when patients present with ocular injury are important.[47] Being knowledgeable of local resources is also vital. Given the frequency of visits after an eye injury, ophthalmologists may be well poised to assist patients experiencing IPV in accessing important resources.[49]

Increasing education to providers at all levels of training is important. Improved education in the form of grand rounds focused on IPV injury patterns, appropriate screening techniques (Box 1), and local resources can have a meaningful impact at an institutional level.[26] Electronic medical record systems can be utilized by prompting screenings when a provider inputs common IPV injury *International Classification of Diseases* (ICD) codes.[26] Programs to expose medical students to IPV prevalence and screening tools, and continuing medical education (CME) programs are helpful for building awareness and skills.[50] For example, the American Academy of Ophthalmology (AAO) offers an online course with CME credits related to IPV.[51]

Increased and continual efforts to evaluate the frequency and prevalence of IPV-related injury in diverse clinical settings are important. For example, rates of oculofacial injuries related to IPV were found to increase during the COVID-19 pandemic.[27] The literature is skewed towards evaluating women with IPV, thus it is important to evaluate IPV in all genders, especially given research suggests high rates of IPV regardless of gender.[2]

Overall, few studies exist evaluating IPV and its relationship with ocular injuries (Table 1), therefore more studies dedicated to this topic would be valuable. Many studies are limited by their retrospective design and the underreported nature of IPV-injuries, thus a prospective study that implements screening for IPV in all ocular injuries at a high-volume center, such as a dedicated eye emergency room, would be helpful. Robust studies evaluating the effectiveness of interventions are important to assist in the evidence-based prevention and treatment of IPV.

Intimate partner violence is highly prevalent among all genders, races, ethnicities, and socioeconomic status, of which ocular and periocular injuries are a common form of trauma. Increased awareness of the association between ocular injuries and IPV is important among all providers, in particular ophthalmologists. Implementation of screening tools when caring for patients who suffer traumatic eye injuries can have a meaningful impact identifying cases of IPV and accessing appropriate resources.

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