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Accident or child abuse? Terminological requirements for clinical documentation of child injuries

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Since children are usually accompanied by an adult when they arrive at a healthcare facility, information about how the injury occurred also originates from the adult. To rule out the possibility of child abuse, the physician attending to child injuries should pay particular attention to whether the trauma marks on the child's body correspond to the circumstances of the injury as described by the adult, e.g., whether the injury could have occurred spontaneously in the event of an accident, taking the child's level of physical and mental maturity into consideration. As physical injuries to both the soft tissue and the skeleton heal more quickly in children than in adults, and the injury itself is the main evidence in any criminal proceedings, great care must be taken in documenting injuries. For this reason, forensic medicine has developed specialized literature on the requirements for documenting injuries in children. Such literature discusses in more detail the characteristics of each type of injury suffered by children. However, a challenging circumstance in clinical care is that the international diagnosis classification (ICD) currently used in Hungary does not treat child injuries separately, thus the pathologies, especially for bone fractures, cannot be coded in sufficient detail. In the present case study, we discuss the terminology used to describe child injuries in detail in comparison with the terminology used for adult injuries based on the literature. We then analyze the documentation of blunt force injuries in 45 clinical records of child injuries, with a special focus on the terms used to describe the external trauma marks and the pathology.

Keywords: terminology, child injuries, blunt force trauma, forensic medicine, forensic medical records, ICD classification

Introduction

The arrival of a child to a medical care unit presenting suspicious injuries has long been a deep and problematic, well-debated issue. Suspicions will arise when the injuries have well-definable presentations of child abuse. As defined by the NSPCC, „*Child abuse is when a child is intentionally harmed by an adult or another child – it can be over a period of time but can also be a one-off action. It can be physical, sexual or emotional and it can happen in person or online. It can also be a lack of love, care and attention – this is neglect.*”¹. However, many child injuries present without definite signs. The responsibilities of the medical care unit workers, for this reason, are without a question of utmost importance. Deciding whether a case is an accident or abuse requires a deep understanding of signs of abuse and not just on the physical but also on the psychosocial level (e.g., physical looks of the child, consistency in what the adult says about the accident, metacommunication of the child and parent, the way the information is delivered, etc.) (Sárközy, 2016).

Child injury heals quicker than those of adults (Skellern–Donald, 2011). Thus, written documentation is essential even when photo documentation is provided of the case. Our aim with this study was to map up how different types of child injuries are present in the latest but also the only piece of Hungarian literature concerning child abuse, to see if the diagnosis categories of ICD (International Classification of Diseases)² are suitable for diagnosing child

¹ <https://www.nspcc.org.uk/what-is-child-abuse/> (Web1)

² <https://www.who.int/standards/classifications/> (Web2)

injuries and to investigate the extent to which authentic, anonymized child injury descriptions and Hungarian diagnoses are detailed to find out more about the practical reality.

Suspicious of child abuse

There are many factors that play a part in cases of child injuries. When arriving at a medical care unit, children are always accompanied by adults. For this reason, the source of information is the adult and not the child. Medical care workers have to rely on their perception of the situation. There are typical signs of abuse such as cigarette burns, spiral fractures on the long bones, injuries that occurred at different points in time, and bilateral subdural hematoma (shaken-baby syndrome) (Herczog–Kovács, 2004) which will necessitate more precise and well-focused documentation of the injuries for the legal procedures. However, if the origin of the injury is ambiguous, the parent should be questioned in more detail about the mechanism of the injury. Thus, questioning the adult about the place, time and type of injury is also important. The mismatches in what is said and what is visible on the child should awaken suspicions. Noting the child's physiological characteristics, locomotor activity, and risk of accidental injuries vs. injuries indicative of defense is also essential (Sárközy, 2016).

In 2014 Louwers et al. developed a 6-question questionnaire as a risk analysis in emergency care. These included the following points for consideration: inconsistency in the medical history taken from the parent, the unexplained delay between the time of injury and the time the child is taken to the hospital, the injury is not self-inflicted, the child-parent interactions are inadequate, the observations are inconsistent with the anamnesis and the home environment is not safe. Diderich (2013) also raised the red flag of disharmony between the child's behavior and the parent's attitude. According to Harris (2006), other signs indicative of abuse are if the area that has been injured is covered by clothing (e.g., upper arm, back, abdomen, gluteal regions and only these areas are affected. Sárközy (2016) (*see Table 1*) called attention to injuries on the dorsal or lateral surface of the body, on proximal regions of limbs rather than in the distal and emphasized that any injury of the genito-anal region should be considered as a case of child abuse.

The need for taking appropriate, accurate records of the injuries including pictures, descriptions, and documentation is of utmost importance when the suspicion of child abuse arises.

Table 1. Types of fractures indicative of abuse (Sárközy, 2016)

High Probability	Low Probability	Not Probable
Typical metaphyseal fracture	Multiple fractures, especially those that are bilateral and of different ages	Periosteal response
Fracture of ribs, with particular regard to the dorsal arch	Fractured fingers, especially in children who cannot walk independently	Fracture of the clavicle
Bone fracture of unusual location e.g. spine, acromion	Complex skull fracture	Diaphyseal fractures of long bones
		Linear fracture of the skull

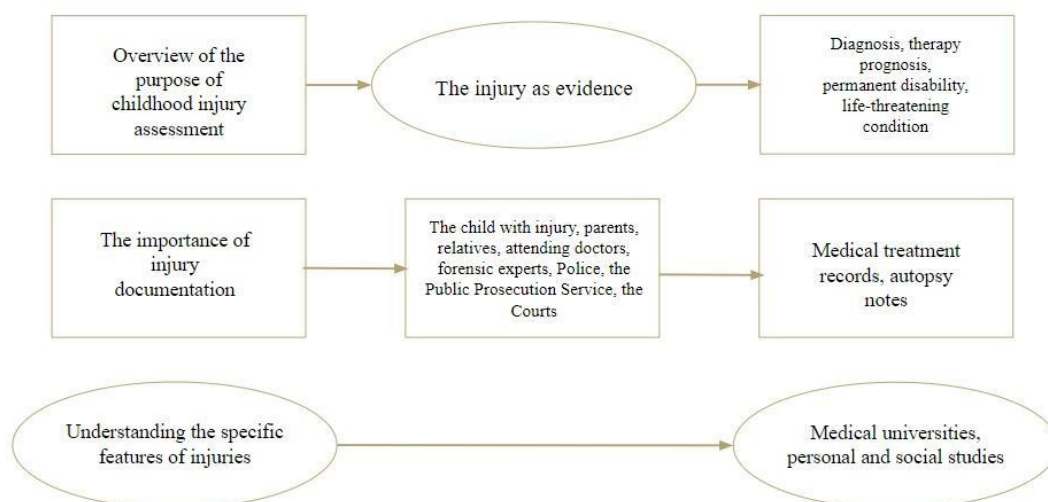
Related documentation

The importance of detailed, unambiguous recording of child injuries has never been under debate. The short and long-term effects and the importance of recording the diagnosis and documentation are demonstrated in *Figure 1* (Törő, 2006:35). However, the lack of focus on the terminological aspects of medical documentation has created many ambiguous records meaning that almost 15 % of the analyzed Hungarian medical reports could be only partly assessed by forensic experts (Fogarasi, 2012) although *medical terminology should accurately reflect the medical diagnosis*” (Christian et al., 2009:1410).

Under the continental legal system, which includes Hungary, court-appointed forensic experts are responsible for assessing the severity of injuries and the weapon involved in the event of a legal proceeding, and then for reconstructing the underlying mechanisms of the injuries. This assessment is conducted based on clinical documentation of accidents and assaults. If the victim survives, their medical records are used; in the event of a fatality, a forensic autopsy is performed. Chronologically, both the initial clinical care and the injury documentation are carried out by primary care physicians, who are the first point of initial contact to investigate the injury before, for example, the investigating authorities are consulted. These statements can be decisive in criminal procedure at a later date. (Schneider, 2017). However, in numerous cases, primary treating doctors are not aware of the fact that they are not only the first, but most probably also the only source of a lot of relevant information. (Fogarasi–Csongor–Schneider, 2014).

After treatment and the start of the recovery phase, the forensic interpretation of injuries cannot be fully performed, i.e. the fundamental mechanisms or the age of the injuries can no longer be reconstructed. By this time, key characteristics of soft tissue injuries such as hematomas and wounds may have changed – especially in children – or, in the case of open wounds, wound characteristics such as margins, edges and walls may no longer be visible due to surgical wound care (Fogarasi, 2012). A prior investigation showed that even in German and Austrian forensic institutions, where there is the facility to carry out an almost immediate forensic examination, the forensic assessment of already closed wounds could not be carried out completely (Fogarasi, 2012). Consequently, in cases of inadequate clinical documentation, important evidence can be lost forever (Schneider, 2017).

Figure 1 Forensic medical aspects of physical abuse in childhood (Törő 2006: 35)



The most emphasized quality requirements for documentation are that they should contain clear, professional and definitive statements. The key is the appropriate, accurate and consistent use of terminology (Fóris–Faludi, 2019) and accuracy, clarity and consistency (Medical Diagnostic Reports of Injuries /MDRIs, cf. Fogarasi 2012). MDRIs serve as evidence in child abuse cases; thus, their appropriacy and precision are highly important.

The first aim of the present study was to investigate how different types of child injuries are present in the latest and only piece of Hungarian literature concerning child abuse. Secondly, we also aimed to see if the ICD categories, equivalent to BNO (Betegségek Nemzetközi Osztályozása) categories in Hungarian³, are suitable for diagnosing child injuries. In Hungary, all diseases and disorders have to be coded in accordance with the ICD classification, and the statistical categories associated with the codes are also used as diagnoses, although these are broad classifications for statistical purposes and are not terminologically suitable for accurately describing injuries (Fogarasi et al., 2019). Thirdly, in this case study, we investigated the extent, to which authentic, anonymized child injury descriptions and Hungarian diagnoses are detailed to find out more about the practical reality.

Methods and Materials

In our study, a manual terminological contrastive analysis of a recently published Hungarian book on child abuse (Nagy–Törő 2016) and the relevant parts of the main Hungarian university textbook on forensic medicine (Sótonyi, 2011) was performed.

The suitability of the ICD classification (required in clinical practice for administrative reasons) for recording the names of childhood injuries in diagnoses was also studied. We performed a manual terminological analysis of the Hungarian version of Chapter XIX of the ICD classification focusing on the possible coding of child-specific injuries.

Our study analyzed 45 anonymized medical reports (see Appendix Figure 2 as an example) from the Traumatology Department of Balassa János Hospital in Tolna County. The study was performed under the Medical Research Council's permission (TUKEB permit number IV/7235-4/2020/EKU). The cases were documented in 2019 and 2020. The relevant parts of the dataset were divided into two sub-corpora within the Sketch Engine Software. The two sub-corpora were 1) Description of external signs of injuries; 2) Hungarian diagnosis.

A terminological concordance analysis (frequency list, keyword analysis, Ngrams /2,3,4,5/ of the 45 descriptions of external signs of injuries as well as the Hungarian diagnoses was performed using the Sketch Engine software. The analysis was performed especially focusing on child-specific blunt force injuries, their description and coding.

Results

Analysis of relevant literature

The study put the use of terminology most specifically relating to the main injury categories within relevant literature under contrastive manual investigation. The textbook on forensic medicine (Sótonyi, 2011) and the book on child abuse (Nagy–Törő, 2016) were analyzed. The two books were written in Hungarian and include the Latin equivalents of the terms but for a clearer understanding, the tables and this study includes both the original Hungarian and Latin terms as well as the English translation.

We found that the Hungarian and Latin terminology of blunt force injuries did not correspond in the two textbooks and they use terms and definitions in an ambiguous way (See Table 2). These ambiguity is signalled with bold letters in the table. Those expressions that were incorrectly used are underlined in the table.

³ <https://fogalomtar.aeek.hu/index.php/BNO> (Web3)

Table 2. Injuries – examples for inconsistent terms and definitions in relevant literature

A. Child abuse (Nagy–Törő, 2016: 38–40)	B. Forensic Medicine (Sótonyi, 2011)
Zúzott seb (<i>vulnus contusum</i>) i.e. Bruised wound	Hámzúzódásos sérülés (no Latin equivalent in book) i.e. Contusion/ Bruise
Horzsolt seb (<i>abrasio</i>) i.e. Abrased wound	Hámhorzsolásos sérülés (<i>abrasio</i>) i.e. Abrasion
Ronsolt seb (<i>vulnus lacerocontusum</i>) i.e. Lacerated wound	Repeztt sérülés (no Latin found) i.e. Laceration
Harapott seb (<i>vulnus morsum</i>) i.e. Bite wound	Harapott seb (<i>vulnus morsum</i>) i.e. Bite wound
Lőtt seb (<i>vulnus sclopetarium</i>) i.e. Shot wound	Lőtt seb (<i>vulnnus sclopetarium</i>) i.e. Shot wound
Vágott seb (<i>vulnus scissum</i> – INCORRECT USE the right term is <i>vulnus caesum</i>) i.e. Chop wound	Vágott seb (<i>vulnus caesum</i>) i.e. Chop wound
Metszett seb (<i>vulnus caesum</i> - INCORRECT USE the right term is <i>vulnus scissum</i>) i.e. Incised wound/ incision	Metszett sérülés/ seb (<i>vulnus scissum</i>) i.e. Incision/incised wound

In the book on child abuse (See column A in Table 2), the term ‘seb’ (wound) was consistently used, however, ‘seb’ means a disruption of continuity. In the Sótonyi textbook (Column B in Table 2) the term ‘sérülés’ (injury) is used which is unambiguous as ‘sérülés’ does not necessarily imply a disruption of continuity, e.g.. ‘hámhorzsolásos sérülés’ (abrasion) does not either. In column A, the term ‘ronsolt’ means a lacerated, smashed wound but *vulnus lacerocontusum* is ‘zúzott seb’. Thus, the Hungarian term is inconsistent with its Latin translation.

Within the terminological discussion of sharp force injuries, we also found that the Nagy–Törő book cites the Latin equivalents of two terms inconsistently (see Table 2), calling a sharp force injury ‘metszett seb’ (incised wound) *vulnus caesum* (chop wound) and a ‘vágott seb’ (chop wound) *vulnus scissum* (incised wound) although all other textbooks and forensic experts use the Latin terms the other way round (Fogarasi, 2011).

Analysis of ICD classification: Chapter XIX

The analysis of Chapter XIX of the ICD classification included a search for injuries and fractures typical of children. We have not found any ICD categories for common fractures in children such as ‘zöldgally törés’ (greenstick fracture), ‘csattörés’/‘tórusz törés’ (buckle/torus fracture), ‘epifizeolízis’ (epiphyseolysis). It was also found that no other sharp or blunt injuries can be coded specifically for children, they are referred to as e.g., ‘felületes sérülés’ (superficial injury) or ‘nyílt seb’ (open wound) without reference to the underlying mechanisms.

Analysis of medical reports of child injuries – Description of external signs of injuries and the Hungarian diagnosis

The examination of 45 medical reports from the Traumatology Department of Balassa János Hospital in Tolna County was conducted using the Sketch Engine software. Two parts of the

reports were analyzed, the description of external signs of injuries (hereafter referred to as Injury description) and the Hungarian diagnoses.

Each injury described in Hungarian medical reports must include Hungarian and Latin diagnoses. The study examined how and with what terminology each type of description appears in both diagnoses. I compared the description of external signs of injuries with the Hungarian diagnosis, because the literal correspondence was mostly observable in this case, as the Latin diagnosis was missing in many cases. Thus, the extent of the Hungarian diagnosis matching the description was investigated. Matching is not meant as a literal match, but in its connotation, it is important that the description and diagnosis refer to the same mechanism of injury and in many cases the same symptoms, even if the diagnosis is a summary for the particular mechanism of injury, not a detailed description.

Terms were analyzed by first extracting a frequency list, we also performed keyword search, Ngram analysis (analysis of collocations, frequent patterns of terms) and concordance analysis. Table 3 represents the frequently used terms found in the two sub-corpora, the Injury description and the Hungarian diagnoses. Figure 3–12 in the Appendix shows the concordance analysis of each of the terms in Table 3.

Table 3. The most frequent entries in the frequency list of terms used in the two sub-corpora

Injury description	Hungarian diagnosis
none	fej
sérülés	sérülés
crepitatio, ütögetés	törés
zúzott/haematoma/duzzanat/duzzadt	zúzódása
abrasio	none

The Hungarian diagnosis most frequently included the term ‘fej’ (head) (*Figure 3*, see *Appendix*). In that injury context, the Hungarian diagnosis documented head injuries where usually the extent of the swelling, the bruising (‘zúzódás’) was described in the external description part which was preceded or followed by the terms ‘seb’ (wound), ‘törés’ (fracture) and ‘szuffúzió’ (suffusion). Mainly the extent of the injury was documented as seen in *Figure 4* (*Appendix*), the extent of the swelling, the area of the fractured bone, wound, and suffusion. The mechanism, however, was not mentioned in the Hungarian diagnosis. The Injury description (*Figure 5*, *Appendix*) was more detailed and more specific, e.g., ‘szúrasi’ (stab), than the Hungarian diagnosis.

In the case of child injuries, during the assessment of the injury, the possibility of fracture is excluded by the physician searching for ‘crepitatio’, abnormal mobility, sensitivity to pressure, etc. In our corpus, when the diagnosis included ‘törés’ (fracture), the Injury description included ‘crepitatio’, signaling sensitivity to pressure (*Figure 6*, see *Appendix*). In *Figure 7* (*Appendix*), the term ‘ütögetés’ (percussion) also signals the same procedure of looking for fractures.

The injury description frequently included the term ‘zúzott’ (bruised) and the Hungarian diagnosis included ‘zúzódás’ (bruise). Based on their concordance analysis (*Figure 8*, *Appendix*) the terms ‘seb’ (wound) and the body parts were visibly accompanying the original terms (‘zúzott’, ‘zúzódás’). With the use of ‘seb’, however, a terminological discrepancy occurs as a bruise does not necessarily mean disruption of continuity (which is the definition of ‘seb’). The term ‘haematoma’ in the Injury description (*Figure 9*, *Appendix*) signals bruise/contusion. The concordance analysis showed that the most frequently used term next to it was ‘felszín’

(surface). The Ngrams had no reference to color, or age of injury, which would be essential diagnostic characteristics.

The term ‘duzzanat’ (swelling) was also frequent in the injury description of our corpus (Figure 10, Appendix), similarly to ‘duzzadt’ (swollen) (see Figure 11, Appendix), the use of which refer to /bruise/contusion. In the Ngrams, the most often used term with these was ‘kifejezett’ (expressed). The color and age (determining factors during child abuse cases) were only mentioned once by the term ‘livid’. The size and looks of the bruises were only described twice by ‘2 cm’ and ‘3 cm’, all the rest of the descriptions used general non-specific terms (e.g. ‘kissé’ (minor), ‘enyhén’ (slightly), ‘ujjbegynyi’ (fingertip size)).

Seeing the frequent use of the term ‘abrasio’ in the description (Figure 12, Appendix), the use of ‘horzsolás’ (abrasion) was checked in the Hungarian diagnosis but no result was found so the description and the diagnosis were inconsistent. This concordance analysis also showed that the depth, size and details of the injuries were mentioned in ambiguous ways, e.g. ‘ujjbegynyi’ (finger tip size), ‘200Ft-snyi’ (size of a 200 Ft coin). The term ‘felületes’ (superficial) occurred with ‘abrasio’ but nothing described which layer of the skin was injured. The most frequent word in the corpus was ‘nem’ (no/not). It occurred 64 times (see Table 4).

Table 4. The occurrence of ‘nem’ (no/not) in the corpus

Word	Frequency ² ↓
1 .	166 ***
2 ,	164 ***
3 a	76 ***
4 nem	64 ***
5 bal	35 ***
6 jobb	26 ***
7 :	21 ***
8 az	21 ***
9 látható	20 ***
10 nyomásérzékeny	18 ***

Discussion

Our study analyzed the use of terminology in relevant literature regarding blunt force injuries. The contrastive manual analysis of the Hungarian books on forensic medicine (Sótonyi, 2011) and child abuse (Nagy–Törő, 2016) found inconsistencies in the use of terms relating to injuries of all underlying mechanisms, especially regarding the Latin terms of sharp force injuries. The Nagy–Törő book used the word ‘seb’ (wound) for injuries whereas previous literature (Fogarasi 2011) and terminological analyses pointed out that ‘seb’ means disruption of continuity (Sótonyi, 2011) but injuries such as abrasion or contusion do not necessarily involve that. It is, however, important to note that the Sótonyi book uses both ‘sérülés’ (injury) and ‘seb’(wound) with the term ‘metszett’ (incised) as sérülés (injury) is a collective category.

In the Nagy–Törő book the term ‘roncsolt’ (crushed) was used with the latin term ‘*vulnus lacerocontusion*’ (meaning lacerated-contused wounds ‘zúzott seb’), however, the definition did mention that the wound was a mixture of a ruptured and contused wound so it was only the Hungarian term that was inconsistent as it differed from terminology found in previous studies (i.e. ruptured and contused wound is ‘zúzott seb’ or ‘repszett seb’ (Fogarasi, 2012). Laceration in the Sótonyi book is also called ‘ruptured injury’ i.e. ‘repszett sérülés’.

Sharp force injuries include incision and chop wound, '*vulnus scissum*' and '*vulnus caesum*', respectively (Fogarasi, 2014, Diriczné Barna, 2016). The Nagy–Törő book referred to incised wound as '*vulnus caesum*' and chop wound was '*vulnus scissum*' (Nagy–Törő, 2016:38-40), using the two terms in reverse, which could cause further terminological mistakes in diagnoses as these two terms were found to be used inconsistently in practice in connection with adult injuries, entailing the possibility of criminal legal consequences (Schneider et al., 2018).

Having analyzed chapter XIX of the Hungarian ICD codes, in line with the literature (Tománé, 2019) we found that child-specific injuries such as 'zöldgally törés' (greenstick fracture), 'csattörés/tórusz törés' (buckle/torus fracture) or 'epifizeolízis' (epiphyseolysis) or Shaken baby syndrome have no coding. These codes were created for a general description of injuries for statistical purposes (Fogarasi et al., 2019) and thus it is not appropriate to describe injuries². We have also found that blunt injuries cannot be appropriately coded either, they are rather referred to as 'felületes sérülés' (superficial injury) or 'nyílt seb' (open wound), which is in line with the literature (Fogarasi et al., 2019).

The analysis of 45 medical reports from the Traumatology Department of Balassa János Hospital in Tolna County was carried out using the Sketch Engine software. The 'description of external signs of injuries' (injury description in short) and the 'Hungarian diagnosis' were analyzed. The frequency list was extracted first, then keyword search, Ngram analysis, and concordance analysis commenced.

Based on the concordance analysis, it can be stated that head injuries were most frequently documented in the analyzed corpus. When the physician assesses an injured child, 'crepitatio', spondylolisthesis and abnormal mobility, sensitivity to impact or pressure are checked (Suneja et al. 2020). In our corpus, when the diagnosis included 'törés' (fracture), the injury description contained 'crepitatio' describing sensitivity to pressure (Figure 6, Appendix). The term 'ütögetés' (percussion) also shows the same assessment procedure (i.e. looking for fractures).

The term 'zúzott' (bruised) was frequent in the injury description, parallel with 'zúzódás' (bruise) in the diagnosis. The concordance analysis of these two terms (Figure 8) showed that they are accompanied by the term 'seb' (wound) and the names of bodyparts. However, a wound does not necessarily imply the presence of disruption of continuity in the skin, which is the definition of a wound (Sótonyi, 2011; Lazarus et al. 1994). Using the term wound instead of injury is a terminological mistake, which may be misleading and can cause confusion in medical professionals. The term 'haematoma' in the injury description also refers to bruise/contusion, which is again not necessarily a disruption of continuity in the skin. The concordance analysis showed the 'haematoma' is followed or preceded by 'felszín' (surface) most frequently. However, the Ngrams revealed no reference to the color or the age of the injury, which would be crucial in child abuse cases (Jackson et al., 2016:183).

The term 'duzzanat' (swelling) and 'duzzadt' (swollen) were also frequent in the injury description (Figure 10-11, Appendix), their use describe bruise/contusion. The Ngram showed that 'kifejezett' (expressed) accompanied these two terms. Again, no reference to color or age of the injury was described but the term 'livid' was used only once. The size and looks of the bruises were only described twice by the terms '2 cm' and '3 cm', all the rest of the descriptions used general, non-specific terms such as 'kissé' (minor), 'enyhén' (slightly), 'ujjbegynyi' (fingertip size). In the case of a child abuse, these medical reports as primary source of proof may not suffice and may be misleading or ambiguous.

The frequent use of 'abrasio' in the injury description made us check for 'horzsolás' (abrasion) in the Hungarian diagnosis but no result was found assuming an inconsistency between the two parts of the medical reports. The concordance analysis of the two terms also showed the ambiguous use of describing the depth, size and details of these injuries by using terms such as 'ujjbegynyi' (fingertip size), '200 Ft-snyi' (size of a 200 Ft coin). The term

‘felületes’ (superficial) was used with ‘abrasio’ but no description was given about what layer of the skin was injured. This description would also be very defining as to the severity of the injury (Pierce, 2010), thus, a detailed description can be critical.

The most frequently used word in the corpus was the word ‘nem’ (no/not) occurring 64 time (Table 4). The results of recent research (Halász–Fogarasi 2018) have shown ‘no’ being the most common term in medical documents, it records the non-existence of certain symptoms, which greatly facilitates differential diagnosis.

Conclusion

In conclusion, Hungarian literature dealing with child injury is rare and the only textbook that exists is ambiguous in the use of terms and definitions relating to injuries. The inconsistency may lead to confusion and the use of ambiguous terms in the documentation and in child abuse cases, a confusing diagnosis can modify the outcome of a legal proceeding.

Chapter XIX of ICD codes in Hungary does not include codes that can differentiate between child and adult injuries. The codes do not include child-specific injuries such as greenstick fracture, torus fracture, or epiphyseolysis, which, in the case of child abuse, would be essential as the medical report of the physician meeting the child as the first point-of-care is an essential document in a child abuse case. Therefore, extension of the international coding system should be reconsidered.

The diagnoses of child injuries are lacking details regarding the exact underlying mechanisms, and additionally, there is an absence of detailed injury descriptions recording the exact size, depth, color, and wound characteristics. If details such as the color, exact size, and in the case of blunt force injuries the shape of an injury or wound are missing, the rule-out of abuse is missing too. The shape of an injury, especially of a hematoma can refer to an object the injury was inflicted with.

Our study used 45 medical reports so the low sample size is a limitation. Thus, a more detailed terminological and statistical analysis of medical diagnostic reports of child injuries is needed to be able to determine how a terminological standardization of literature and documentation is possible in order to enhance the early clinical detection of possible child abuse cases.

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Appendix

Figure 2. Medical report (example taken from the corpus)

<p>Szül. év:2002 Orvosi ellátás éve:2019</p>	
<p>Az előzményi adatok (a sérült vagy kísérő közlése alapján a sérülés elszívódásának ideje, helye és körülményei, az eszméletlen állapot időtartama, a fogyasztott szeszes ital megjelölése és mennyisége): A fiatal és a nevelő elmondása alapján: Nevelő kíséretében érkezik [redacted] látelet felvétele céljából. 2019.08.04. Este [redacted] kiment az otthonból (21 óra körül), (volt gyógyszerári központhoz - "betonos"-nak említi) [redacted] és [redacted] követték, valamint [redacted] barátja [redacted] saját cigarettájából kértek, aki nem szeretett volna adni. Ekkor szóváltásba keveredtek, melyet követően [redacted] fellökte, haját húzta [redacted] hajánál fogva a fejét a betonba ütötte, torkát szorongatta, arcát karmolta össze-vissza. Majd [redacted] lefogta [redacted] mije [redacted] az arcát illetve hasát kezdte lábával rúgni. [redacted] nem segített sem a lányoknak, nem [redacted] ezek néztek a történések. [redacted] barátja kezdetől fogva ott volt a helyszínen, próbált is segíteni, azonban [redacted] elmondása szerint [redacted] megütötte [redacted] is. Ezt követően [redacted] 23 óra körül visszament az intézetbe, átöltöztött és elindult a buszállomásra azzal a céllal, hogy [redacted] hazamegy anyukájához. Rendőrség útközben rátalált, visszavitették az intézetbe. [redacted] elmondása szerint az elmúlt 1 hétben biztosan nem fogyasztott állandó gyógyszerein kívül egyéb gyógyszert, droghasználatot negál. A verekedés kapcsán eszméletvesztésről megbízható információ nem nyerhető [redacted] Vizeletet mai napon már ürített, véresnek, cola színűnek nem látta. Reggel felkelest követően zsiabdát a feje, szédült, hányinger, hányás nem volt. Fején kívül egyéb testtájékot nem fájlat. Szexuális inzultust negálja.</p>	
<p>A sérüléssel összefüggő panaszok. Reggel felkelest követően zsiabdát a feje, szédült, hányinger, hányás nem volt. Fején kívül egyéb testtájékot nem fájlat.</p>	
<p>Jelen állapot (általános fizikális, belgyógyászati állapot): Acutan jó általános állapot. Az arcon mkét arcfélen, homlokon, mellkas középső részén több kb 3cm-s vonalszerű felületes hámsérülés, némelyik hyperaemias udvarral körülvéve, mkét oldali járomcsont felett kb 0,75x2cm-s suffusionnal imponáló elváltozás, járomcsontok nyomásra érzékenyek, nevelő elmondása szerint mkét arcfél fel van duzzadva, jobb oldalon parietáisan nyomásra fájdalmat jelez, külsérelmi jel nem látható, a jobb emlő felső felületén a bimbóudvartól 1 cm-re egy 2x2,5m-s haematoma. Bal alkaron korábbi falcolás nyomai. Sarok felett ill. mko Achilles in felett korábbi irritáció nyoma. Medence és borakosár nyomásra nem érzékeny, bal oldalon sacralísan néhány felületes abrasio. Egyebekben bőre tiszta, turgora megtartott, oedema, icterus, cyanosis nincs. Nyálkahártyák kp.vérbővek Lobosság nincsen. Megnagyobbodott nyirokcsomók nem tapinthatóak. Szája tiszta, nyelve nedves, bavoat. Garatképletek kp.vérbővek, lobmentesek. Tüdo felett mko. érdes alaplégzés. Zőre és oldalkülönbség nincs. Tiszta ritmusos szivhangok, zőre nem hallható. Kompenzált keringés. Bal bordaív alatt ill. a jobb hasfélben nyomásra fájdalmat jelez, ezen területeknek megfelelően izomvédekezés észlelhető, vesék ballotálásra nem érzékenyek, kp élénk bélhangok. Egyebekben hasa puha betapintható, egyéb kóros rezisztencia és nyomásérzékenység nem tap. Máj nem tap, lép nem ítelhető meg. Meningeális izgalmi jelei nincsenek, tarkó szabad.Neurológiai gőcjelei nincsenek.</p>	
Vérnyomás: 113/75 Hgmm	Pulzus: 62/min
<p>Az idegrendszeri állapot (reflexek, Romberg-tűnet, pupillák stb.), valamint az agyrázkódásra utaló tünetek (eszméletvesztés, emlékezetkiesés, vegetatív tünetek): Koponya normális konfigurációjú, külsérelmi nyomok lást fenn. Gerincen patológiás görbület nem látható. Tudata tiszta, tarkója szabad, meningeális jelek nincsenek. Visus ép, látótere konfrontális módszerrel megtartott, látászavarról (szikralátás, hom. látás, látóterkiesés nincsen). A pupillák egyenlők, közepesen tágak, ép szélűek, kerekék, centrálisan helyezkednek el, fényre és accomodatoriára jól reagálnak. Nystagmus nincs. A szemmozgások minden irányban szabadok. Strabismus nincs. Az arc szimmetrikus, n.facialis jól innervál. Hallás ép. Garatreflex kiváltható, szimmetrikus, kiöltött nyelv nem devial, mozgásai szabadok, nyelés ép. Az izomzat tónusa, trophiája, ereje norm., szimmetrikus. A mélyreflexek testszerte kp. élénkek, szimmetrikusak. Babinski tűnet negatív. Vegetatív tünete nincs. Célkísérletek rendben. Rombergben dőlés nélkül megáll, nehezített Rombergben bizonytalan. Érzészavart nem jelez. Beszéde ép, aphasia nincs. Járása ép. Éber, orientált.</p>	
<p>Az alkoholos állapot fizikális jelei (alkoholos lehelet, kötőhártyák állapota stb.) és pszichés tünetek (beszéd, magatartás, tájékozódás, emlékezőképesség stb.): alkoholos állapotra utaló jeleket nem észleltünk Beszéde ép, aphasia nincs. Járása ép. Éber, térben, időben orientált. Kérdésekre adekvált válaszokat adott.</p>	
<p>A külsérelmi nyomok (sebek) helye: Az arcon mkét arcfélen, homlokon, mellkas középső részén több kb 3cm-s vonalszerű felületes hámsérülés, némelyik hyperaemias udvarral körülvéve, mkét oldali járomcsont felett kb 0,75x2cm-s suffusionnak imponáló elváltozás, járomcsontok nyomásra nem érzékenyek, nevelő elmondása szerint mkét arcfél kissé fel van duzzadva (fiatal szerint nem). Jobb oldalon parietáisan nyomásra enyhe fájdalmat jelez, külsérelmi jel nem látható, a jobb emlő felső felületén a bimbóudvartól 1 cm-re egy 2x2,5m-s haematoma. Bal alkaron korábbi falcolás nyomai. Sarok felett ill. mko Achilles in felett korábbi irritáció nyoma. Medence és borakosár nyomásra nem érzékeny, bal oldalon sacralísan néhány felületes abrasio</p>	
<p>A szakorvosi leletek (RTG stb.) részletes feltűntetése: 2019.08.05 Ultrahang Vizsgálat [redacted] PR Hepar, cholecysta, choledochus,pancreas, mkét vese, lép UH képe norm. A hasi nyagerek épek, környezetükben megnagyobbodott nyirokcsomók nem látszik. Path. kokárda nem mutatható ki. Szabad hasi folyadék nincs. Hólyag üres, kismedence nem vizsgálható. Vélemény: Negatív hasi UH. Hasi szervsérülés nem igazolható.</p>	
<p>A sérült ellátása (gyógykezelés, kötés, műtét, rendelőintézetbe, fekvőbeteg gyógyintézetbe irányítása stb.): Hasi UH vizsgálat során hasi sérülés nem igazolódott. Vizelet vizsgálat során amiláz érték emelkedetebb, ezért kiegészítő labor vizsgálatokat indikálunk, mely során normál serum amiláz és lipáz értéket észleltünk, mely vizsgálatokkal a hasnyálmirigy sérülés nagy valószínűséggel kizártuk. Vizelet vizsgálata során vese zűzódására, sérülésére utaló eltéréseket nem észleltünk(vér-neg). Vitális paraméterek norm. tartományban voltak. Obszervációknk ideje alatt tűnet, panasz nem jelentkezett. Osztályos felvételét terveztük, további obszerváció céljából, azonban Kitti fenyegetőzött, hogy megszökik. Gyám ambulancián személyesen jelentkezett, a gyermek édesanyjával. Kitti ígéretet tett, hogy az édesanyjától nem szökik el, a gyám jóváhagyását adta, hogy az édesanyjához mehet.</p>	
<p>A kórisme (magyarul és latinul): A fej többszörös felületes sérülése</p>	
<p>Vélemény:</p>	
<p>Megjegyzés (pl. várható-e maradandó testi fogyatékoság vagy súlyos egészségromlás): Az elvégzett ambuláns vizsgálatok alapján nem várható testi fogyatékoság.</p>	

Figure 3. Analysis of 'fej' (head) in the Hungarian diagnosis

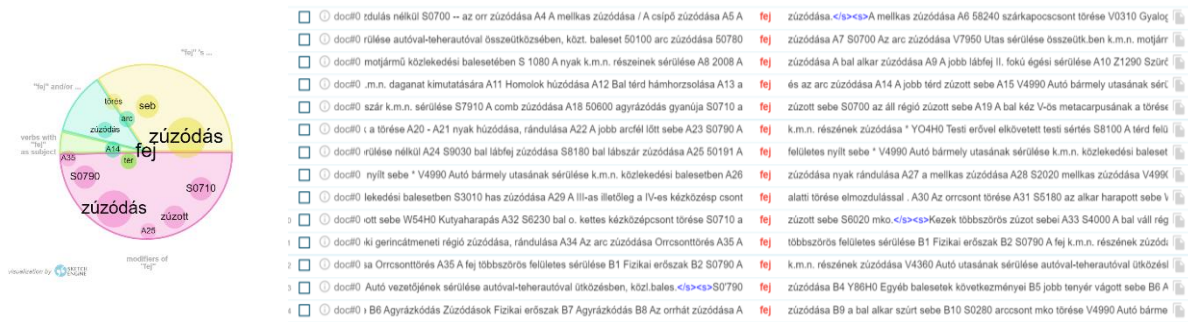


Figure 4. Analysis of 'sérülés' (injury) in the Hungarian diagnosis



Figure 5. Analysis of 'sérülés' (injury) in the injury description

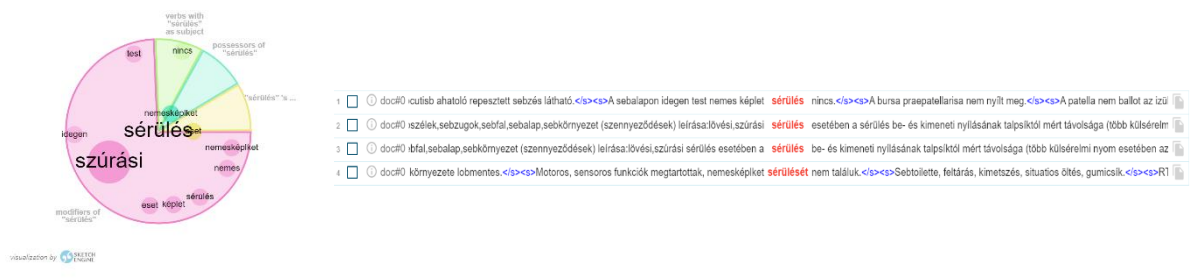


Figure 6. Analysis of 'crepitatio' in the injury description and 'törés' in the Hungarian diagnosis

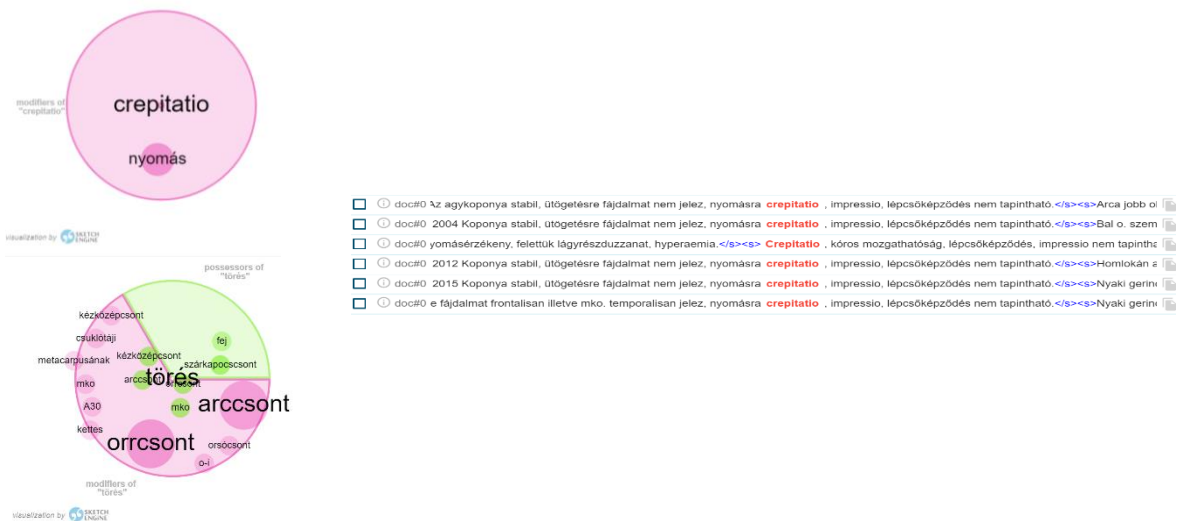
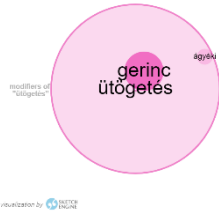
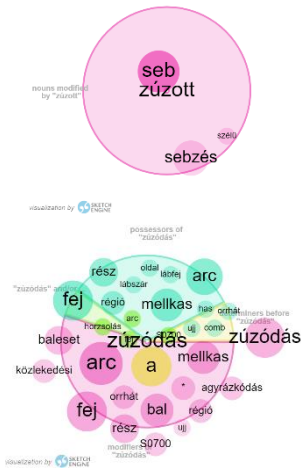


Figure 7. Analysis of ‘ütögetés’ (percussion) in the injury description



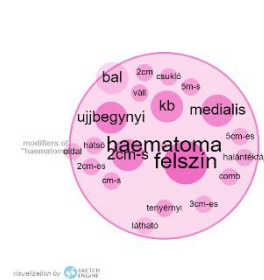
1	<input type="checkbox"/>	doc#0 mhiány, nem vérzik, nem válladékozik.</s><s>A2 Szül. év: 2009 Az agykoponya stabil, ütögetésre fájdalmat nem jelez, nyomásra crepitatio, impressio, lépcsőképződés nem tapintható.</s>
2	<input type="checkbox"/>	doc#0 bőrén friss külsérelmi nyom nem észlelhető.</s><s>A6 Szül. év: 2004 Koponya stabil, ütögetésre fájdalmat nem jelez, nyomásra crepitatio, impressio, lépcsőképződés nem tapintható.</s>
3	<input type="checkbox"/>	doc#0 vads, érzés- vagy mozgásképes felső végtagokban nincs.</s><s>H4s-, ágyéki gerinc: ütögetésre nem fájdalmas, paravertebrális izomzat nem nyomásérzékeny.</s><s>Medence stabil.</s>
4	<input type="checkbox"/>	doc#0 in pár mm-es zúzott seb.</s><s>A26 2004 - A27 2012 nincs A28 2012 Koponya stabil, ütögetésre fájdalmat nem jelez, nyomásra crepitatio, impressio, lépcsőképződés nem tapintható.</s>
5	<input type="checkbox"/>	doc#0 armada nyomásérzékeny.</s><s>Mko. jól kitérő rekeszek.</s><s>H4s-, ágyéki gerinc: ütögetésre nem fájdalmas, paravertebrális izomzat nem nyomásérzékeny.</s><s>Kisugárzó fájda
6	<input type="checkbox"/>	doc#0 mb lateralis felszínén egy 1 cm-es szervült hematoma látható B2 2015 Koponya stabil, ütögetésre fájdalmat nem jelez, nyomásra crepitatio, impressio, lépcsőképződés nem tapintható.</s>
7	<input type="checkbox"/>	doc#0 g sugaras vizsgálatot jelenleg nem tartok indokoltnak.</s><s>B3 2010 Koponya stabil, ütögetésre fájdalmat frontálisan illetve mko. temporálisan jelez, nyomásra crepitatio, impressio, Méj
8	<input type="checkbox"/>	doc#0 zúzott, bal lábát húzza.</s><s>Bokákon, lábfejekken eltérés nem látható.</s><s>Gerinc: ütögetésre mérs. érzékeny.</s><s>B7 2015 A fejletén hátul jobb oldali részén 3cm-s hyperaemiás

Figure 8. Concordance analysis of ‘zúzott’ (bruised) in the injury description and ‘zúzódás’ (bruise) in the Hungarian diagnosis



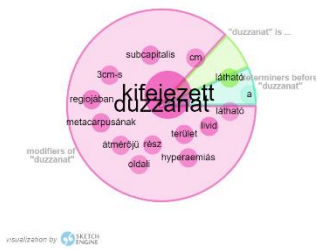
<input type="checkbox"/>	doc#0 pzódés nem tapintható.</s><s>Bal o. szemöldöke felett kb 3cm-es zúzott sebzés látható, mely körül kis abrasio.</s><s>Sebtoiletto.</s><s>S
<input type="checkbox"/>	doc#0 va kell felsorolni): Frontálisan kp. és kissé balra mélyebb 1-1 cm-es zúzott sebek.</s><s>Orr csúcán mély abrasiók, halló- és orrjáratok szab.
<input type="checkbox"/>	doc#0 ráladékozás nincs.</s><s>Állon átlósított mögött 2 db roncsolt széllő zúzott sebzés, hámsérüléssel.</s><s>Jobb felső I-es fog gyökerektől kitört.
<input type="checkbox"/>	doc#0 es zúzott seb.</s><s>A homlok területén a kp. vonalban pár mm-es zúzott seb.</s><s>A26 2004 - A27 2012 nincs A28 2012 Koponya stabil, (
<input type="checkbox"/>	doc#0 sebzés.</s><s>Bal kézhatán IV-Vös MCP között 2 cm-es felületen zúzott sebzés, II-es MC felett felületen ropesztott 3 mm-es sebzés.</s><s>
<input type="checkbox"/>	doc#0 Jobb kézhatán és hosszú ujjakon dorsalisán számos apró felületen zúzott , vágott sebzés.</s><s>A33 2005 A bal vállon középtájt kb. ujjnyi ni
<input type="checkbox"/>	doc#0 rca duzzadt, nyom érz.</s><s>Állán 2 cm-es kisá egyentlen széllő zúzott seb.</s><s>Frontálisan jobb oldalon lenyicsányi abrasio.</s><s>Sz
<input type="checkbox"/>	doc#0 bevérzés.</s><s>Jobb csomb medialis felszínén 2 cm-es felületen zúzott seb.</s>

Figure 9. Concordance analysis of ‘haematoma’ in the injury description



Details	Left context	KWIC	Right context
<input type="checkbox"/>	doc#0 íbb emlő felszínén a bimbódvárat 1 cm-re egy 2x2,5m-s haematoma	</s><s>Bal alkaron korábbi falcolás nyomai.</s><s>S	Sarok fele
<input type="checkbox"/>	doc#0 leten hámsérülés, vérárvadék látható, halántékján kb 5cm-es haematoma	tap.</s><s>Jobb fülon abrasiók, a bal fül külső hallójáratra illeszt	
<input type="checkbox"/>	doc#0 >Jobb szem alatt kb 5cm-es abrasio, bal szem alatt kb 3cm-es haematoma	, felső ajkán közepén abrasio, mko oldali állkapocsizület nyomá	
<input type="checkbox"/>	doc#0 eszelnén 3cm-es vérárfutás.</s><s>Hát bal oldalán ujjbegynyi haematoma	, bal vállán 2cm-s haematoma, bal oldali bordaiv alatt ujjbegynj	
<input type="checkbox"/>	doc#0 's><s>Hát bal oldalán ujjbegynyi haematoma, bal vállán 2cm-s haematoma	, bal oldali bordaiv alatt ujjbegynyi haematoma látható.</s><s>	
<input type="checkbox"/>	doc#0 bal vállán 2cm-s haematoma, bal oldali bordaiv alatt ujjbegynyi haematoma	látható.</s><s>Végtagok: bal alkar középső részén 4cm, alatta	
<input type="checkbox"/>	doc#0 ó.</s><s>Végtagok: bal alkar középső részén 4cm, alatta 2cm haematoma	, bal csukló medialis felszínén 2cm-es haematoma, egész bal k	
<input type="checkbox"/>	doc#0 i, alatta 2cm haematoma, bal csukló medialis felszínén 2cm-es haematoma	, egész bal kézfej duzzadt, kékesen elszíneződött, nyomásra éi	
<input type="checkbox"/>	doc#0 flexio korlátozott.</s><s>Jobb alkar medialis felszínén 4 cm-s haematoma	(harapásnyom), mozgáskorlátozottság nem észlelhető.</s><s>	
<input type="checkbox"/>	doc#0 letek mozgása megtartott.</s><s>Bal combon felülről tenyérmí haematoma	, duzzanat látható, jobb comb hátsó felszínén 2cm-s haemator	
<input type="checkbox"/>	doc#0 aematoma, duzzanat látható, jobb comb hátsó felszínén 2cm-s haematoma	</s><s>Mozgása korlátozott, bal lábát húzza.</s><s>Bokákon	
<input type="checkbox"/>	doc#0 agyságú szűrt seb bemeneti nyílása B10 2014 Mko sezm körül haematoma	, mk orrjáratból friss vérzés.</s><s>Arca duzzadt, nyom érz.</s>	

Figure 10. Concordance analysis of ‘duzzanat’ (swelling) in the injury description



1	<input type="checkbox"/>	doc#0 n tapintható.</s><s>Arca jobb oldalán a szeme alatt kifejezett livid duzzanat	, a járomív nyomásérzékeny, Szemhéj duzzadt, szem nyitása korlá
2	<input type="checkbox"/>	doc#0 </s><s>Orrhát duzzadt, suffusio látható.</s><s>Jobb csukló körül duzzanat	</s><s>A4 Szül. év: 2001 Külsérelmi nyom nem látható.</s><s>A
3	<input type="checkbox"/>	doc#0 - A11 Szül. év: 2013 Homlokban bal oldalon 7 cm átmérőjű területen duzzanat	</s><s>A12 2009 Bal térdkalács alsó csúcs alatt minimális hámsér
4	<input type="checkbox"/>	doc#0 1 A bal kéz V-ös metacarpusának subcapitis regiojában kifejezett duzzanat	és nyom érz tap.</s><s>Az ökölképzés a fájdalom miatt beszűkül.
5	<input type="checkbox"/>	doc#0 zínthatók.</s><s>A29 2004 A jobb kézhatá kifejezetten duzzadt a duzzanat	punctum amximuma a III-s MCP izület felett észlelhető.</s><s>A II
6	<input type="checkbox"/>	doc#0 gása megtartott.</s><s>Bal combon felülről tenyérmí haematoma, duzzanat	látható, jobb comb hátsó felszínén 2cm-s haematoma.</s><s>Moz
7	<input type="checkbox"/>	doc#0 <s>B7 2015 A fejletén hátul jobb oldali részén 3cm-s hyperaemiás duzzanat	</s><s>B8 2003 Durva friss külsérelmi nyom nem volt észlelhető.</s>

Figure 11. Concordance analysis of ‘duzzadt’ (swollen) in the injury description



Figure 12. Concordance analysis of ‘abrasio’(abrasion) in the injury description

