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Leczenie bólu w okresie przedszpitalnym u oparzonych dzieci

Streszczenie

Wstęp. Oparzenia stanowią jeden z najcięższych urazów wieku dziecięcego. Do najważniejszych działań w udzielaniu pomocy dziecku oparzonemu należy wdrożenie leczenia przeciwbólowego w okresie przedszpitalnym. Niestety wśród lekarzy zrozumienie roli tego leczenia nie jest zadawalające.

Cel. Celem pracy była ocena pierwszej pomocy medycznej w aspekcie leczenia przeciwbólowego u dzieci oparzonych.

Materiał i metody. Badaniem retrospektywnym objęto 193 dzieci, które zgłosiły się w ciągu roku z powodu oparzenia do Oddziału Klinicznego Medycyny Ratunkowej dla Dzieci w Łodzi. W oparciu o dokumentację medyczną poddano analizie ich sposób zaopatrzenia przeciwbólowego.

Wyniki. W badanej grupie odnotowano przewagę chłopców (57,5%) oraz dzieci do 4 roku życia (61%). Najczęstszą przyczyną urazu było oblanie gorącym płynem (81% badanych). Oparzenie najczęściej dotyczyło szyi/twarzy – 36 dzieci (17%), klatki piersiowej – 67 dzieci (33%), kończyny górnej – 60 dzieci (29%) i były to głównie oparzenia powierzchowne – 154 dzieci (75%). Leki przeciwbólowe otrzymało 12 spośród 23 dzieci przywiezionych przez zespoły ratownictwa medycznego, 4 spośród 20 dzieci zaopatrzonych w POZ i 30 spośród 150 zaopatrzonych przez rodziców. Analiza statystyczna nie wykazała istotnych różnic między podmiotami wdrażającymi leczenie przeciwbólowe u oparzonych dzieci w odniesieniu do liczby dzieci, które otrzymały leczenie. Zaobserwowano jednak różnice dla zespołów ratownictwa medycznego na poziomie $p<0,01$ i dla rodziców $p<0,05$ w odniesieniu do ogółu. Nie zaobserwowano istotnych różnic między wdrożeniem leczenia przeciwbólowego a wiekiem dziecka, lokalizacją i głębokością oparzenia oraz kwalifikacją do leczenia szpitalnego. Przeprowadzone badania potwierdziły brak umiejętności udzielania pierwszej pomocy oparzonym oraz o niedostateczną jakość przedszpitalnej pomocy medycznej.

Wnioski. Koniecznym wydaje się opracowanie jednolitego algorytmu leczenia bólu u oparzonych dzieci w zależności od stopnia ciężkości oparzenia oraz intensyfikacja kształcenia lekarzy, pielęgniarek i ratowników w zakresie leczenia bólu u dzieci oparzonych.

Słowa kluczowe: ból, postępowanie przedszpitalne, oparzenia, dzieci.

Prehospital pain treatment in children with burns

Abstract

Introduction. Introduction. Burns are one of the most serious children's injuries. The most important activities in the scope of assistance for a child with burns include implementation of pain treatment in the prehospital period. Unfortunately, the level of understanding of the role of this treatment among doctors is not satisfactory.

Aim. To evaluate the pain treatment in children with burns in prehospital period.

Material and methods. Retrospective survey covered 193 burned children admitted to the Clinical Department of Emergency Medicine for Children in Łódź. The quality of pain treatment was analyzed on the basis of medical documentation.

Results. In the studied group, the majority were boys (57.5%), and children below 4 years old (61%). Spilling hot liquid was the main cause of injury (81%). Burns covered mainly: neck/face – 36 children (17%), chest – 67 children (33%), upper limb – 60 children (29%); 75% burns were superficial. Painkillers were provided to 12 our of 23 children transported by medical rescue teams, 4 out of 20 children treated by family doctors, and 30 out of 150 children assisted by parents. The statistical analysis did not demonstrate significant differences between entities implementing pain treatment with regard to the number of children treated. Differences were observed in the case of medical rescue teams on the level $p<0.01$, and in the case of parents - $p<0.05$, as opposed to the entire number of children. There were no significant differences between implementation of pain treatment and age of a child, location, depth of burn and qualification for hospital treatment. The research confirmed lack of first aid skills and inadequate quality of prehospital medical assistance in researched field.

Conclusions. It is necessary to prepare a uniform algorithm for pain treatment in children with burns and to intensify trainings of doctors, nurses, and rescuers with regard to pain treatment.

Keywords: pain, prehospital treatment, burns, children.

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INTRODUCTION

Burns are one of the most destructive injuries that may afflict a child, because they affect all aspects of its health – physical and mental. Each year about 1% of the whole population suffers from burns, of which 30-55% are children. According to statistical data, in the USA, every year approximately 2 million people suffer from burns, and in the UK – approximately 250.000 persons [1-4]. In Poland, due to the lack of a register of injuries, we have no accurate data on the scale of this phenomenon. It is estimated that every year in our country about 1.500 children aged from 0 to 18 are treated in children's surgical wards because of burns, and, just as anywhere else in the world, small babies below 4 years of age constitute the majority of hospitalized. In the period of recent 25 years, great progress in burn treatment has taken place, which manifests itself in significant decrease of mortality rate due to extreme burns, and obtaining more and more beneficial results of the treatment. Currently children with burns covering approximately 90% of their bodies have a chance of survival in the selected centres in 50–80% of the cases, while in the leading countries this number approaches 100%. Despite this progress in burn treatment, burns still remain the second cause of traumatic deaths among children [1-8].

Children are usually afflicted with burns in their family house as a consequence of an unfortunate accident, resulting from low quality of family care, low level of parents' and carers' awareness of the hazards of daily life concerning their children [6-10]. Although burns in the case of children are most often caused by an unfortunate accident, one should remember that a burn may also be a result of a non-accidental injury/burns on feet and palms, burns in the shape of household objects, or produced as a result of stubbing out a cigarette on a child's skin [3].

Notwithstanding the circumstances of a burn, the first reaction of the system to thermal injury is pain caused by direct, massive and prolonged nociceptor stimulation originating from the injured tissues. Initiated protective pain mechanisms are insufficient, and this fact results in release of a number of undesirable system reactions on the part of heart and vascular, respiratory, and nervous systems, which are accompanied by blood coagulation disorders and pulmonary embolism [11]. Therefore maintenance of system homeostasis and reduction of pain and suffering are one of first and most significant activities in prehospital treatment. Such action substantially affects not only further course of treatment, but also its costs [12]. Unfortunately, understanding of the role of children burns pain treatment in prehospital treatment is not satisfactory. As it results from survey studies, accident witnesses – people who often have undergone BLS training, do not recognize the need to use analgesics [13,14]. What is worse, pain treatment is not initiated by a number of medical rescue teams [9,12]. The scope of this phenomenon depends not only on the degree of training of young doctors in the field of emergency medicine, anesthesiology, surgery, or other similar domains, but also on assumption of harmful models [15].

AIM

The purpose of this study was to evaluate the methods of provision of pain treatment to children with burns under first aid, on the basis of the cases that have been treated during the year in the Clinical Ward of Children Emergency Medicine in Maria Konopnicka University Clinical Hospital No.4, at the Medical University in Łódź.

MATERIAL AND METHODS

The retrospective survey covered 205 burned children aged 0 to 18 out of 14,499 children treated during the period of 12 months in the 2008. Sex and age of the children, burn mechanism, depth of burns, method of provision of first aid and prehospital medical assistance, with particular focus on the use of analgesics, have been analyzed. With the aid of chi^2 test, the relation between provision of analgesics and age of a child, location of a burn and the degree of a burn, have been also inspected. The characteristics of the studied group is presented in Table 1.

RESULTS

Among 14,499 patients, who during the year came to the ward, children with burns constituted 1.3% (193 children).

Sex and age of children with burns

Among the children with burns there were 111 boys (57.5%), and 82 girls (42.5%) (Table 1). Advantage of boys among children with burns was also noted in other studies, and it resulted from greater physical activity of boys [1,5-8].

The age of children with burns fluctuated from 3 months to 18 years, and, like in the research of other authors, small babies up to 4 years of age dominated (126 among 193 children – 65.3%) (Table 1) [1,5-8].

TABLE 1. Characteristics of the studied group; n=193.

Sex	Number of children
Girls	82(42.5%)
Boys	111(57.5%)
Age	
0-12 months	8
1-4 years	118
> 4 years	67
Burn cause	
Spilling hot liquid	167
Touching hot surface	20
Burning with flame	4
Sun burn	2

Burn cause

Most often burns were a consequence of spilling hot liquid – 167 children (81%), 6 of which (4%) suffered from burns with hot oil. Next most frequent cause of burns was touching hot surface – 20 children (10%), burning with a flame – 4 children (2%), and sun burn – 2 children (Table 1). High percentage of small children among children with burns,

and spilling hot liquid as the main burn mechanism, suggest a lack of parental knowledge about behaviour of a little child, and inadequate care over the children [1-8,10,12,14].

Burns location and depth

In the examined group, the surface of burns most often covered chest – 67 children (30%), and upper limbs – 60 children (29%). Further on, face/neck – 36 children (18%), hand – 30 children (15%), forearm – 21 children (10%), foot – 21 children (10%), belly –16 children (8%), thigh – 16 children (8%), shin – 16 children (8%), shoulder – 13 children (6%), and in 2 cases – lower limb. More than 80% of children with burns (165 children) were children with burns of multiple body areas.

Initial assessment of burn depth according to Artz, Reiss, and Shakespeare, which was performed at the time when children were admitted to the Ward in the majority of cases (154 – 75%) indicated superficial burns of I°-II°. Deep burns (II b^o and III^o) were observed only in the case of 29 children – 14%. Lack of assessment of the degree of burn depth in the medical documentation was recorded in the case of 10 children [16]. The medical documentation, except for a few exceptions, included no information about the extent of burns.

The unit granting assistance directly after occurrence of a burn, and type of first aid provided

Directly after occurrence of a burn children were provided with assistance of:

- parents or carers, who themselves transported a child from the house to the hospital – 150 children (78%)
- family doctor whom parents visited with children suffering from burns – 20 children (10%)
- medical rescue team called in emergency – 23 children (12%) (Table 2).

This low percentage of emergency calls to medical rescue teams probably resulted from the fear of a prolonged ambulance response time.

First aid provided by parents or carers of children directly after occurrence of a burn consisted in taking off the clothes and cooling the burn (83 among 193 children /43% of cases/), spraying the burnt surface with panthenol in 9 cases (4.6%), and rubbing an ointment on the burnt surface in 6 cases (3.1%). In addition, 30 out of 150 children with burns assisted by parents or carers (20%) received painkillers/pyralginum or paracetamol suppository, pyralgine or paracetamol pills, or panodol syrup. In 94 cases (48.1%) no first aid was initiated. In the case of 3 children no information in this scope was taken down during the interview (Table 3).

Prehospital medical help was granted by medical rescue teams or by family doctor to 43 children out of 193 (22.2%). It consisted in cutting off the contact with the source of heat /provided that this had not been done earlier/, evaluation of burn depth, and protection of the burn with a dressing against infection. In addition, painkiller was provided to 12 among 23 children transported by medical rescue teams (52.1%), and to 4 among 20 children who were first taken care of by a family doctor (20%).

Pain treatmen*t*

Pain treatment before the arrival to the hospital was used only in the case of 46 out of 193 children children with burns (23.8%). Painkillers were given to 12 children (25.5%) by a medical rescue team, to 4 (8.5%) – by a family doctor, and to 30 (66%) by parents (Table 4).

Statistical analysis has not demonstrated significant differences between persons providing pain treatment to children with burns in relation to the number of children treated. Differences have been, however, observed in the case of medical rescue teams on level $p < 0.01$, and in the case of parents – $p<0.05$, as opposed to the entire number of children. In the group of 147 burned children, who were not provided with pain treatment, 5 children admitted to the Clinical Ward of Children Emergency Medicine were diagnosed with symptoms of burn shock.

Pain treatment and age of the burned child

In the group of children with burns less than 12 months old (n=8), 1 child was given painkiller in the form of paracetamol suppository applied by its parents (12.5%). Among 118 children aged 13-48 months, pain treatment was used in the case of 29 children (24.5%) – in 19 cases painkillers were provided by parents (66.5%), in 7 cases (24.2%) – by rescue teams , and in 3 cases (9.3%) – by family doctors. Among 67 children with burns above 4 years old, painkillers were served to 16 children (24%) – to 10 children – by parents (62.5%), to 5 children – by medical rescue teams (31.25%), and to 1 child – by a family doctor.

No children below 13 months were reported among 16 children who received painkillers in the prehospital period from their family doctor, or from a medical rescue team (Table 5).

TABLE 2. Entities granting assistance directly after occurrence of a burn; n=193.

Entity granting assistance	Number of children
Medical rescue team	23 (12%)
Family doctor	20 (of 10%)
Parents	150 (78%)

TABLE 3. Type of first aid granted to children with burns by parents/ carers.

Type of granted first aid	Number of children; n=193
Cooling burns	83 (43%)
Spraying burn with Panthenol	9 (4.6%)
Rubbing ointment	6 (3.6%)
Provision of analgesics	31 (16.1%)
Lack of any first aid	94 (48.1%)
No data	3

TABLE 4. Entities implementing pain treatment in the case of children with burns.

Share of particular entities in pain treatment	Number of children n=46
Ambulance rescue teams	12 (25.5%)
Family doctor	4 (8.5%)
Parents	30 (66%)

TABLE 5. Provision of analgesics and age of a child.

Entity implementing pain treatment	Age of a child	Number of children n=46
Ambulance rescue teams n=12	0-12 months	0
	1-4 years	7
	>4 years	5
Family doctor n=4	0-12 months	0
	1-4 years	3
	>4 years	1
Parents n=30	0-12 months	1
	1-4 years	20
	> 4 years	10

In the group of children (n=12) provided with pain treatment by medical rescue teams in the prehospital period, the age of the patients fluctuated from 13 months to 17 years, and 6 among 12 children (50%) in this group were younger than 4 years old, 2 children were 5, 1 child was almost 9, and 3 children were 11, 12, and 17. In the group of 4 children provided with pain treatment by a family doctor there were children aged from 19 months to 8 years; 3 of these children were less than 4 years old. (Table 5). Analysis of the frequency of administering medicines in a given age group by different persons has indicated that most often painkillers were given by parents, in the second place – by medical rescue teams, and least frequently – by family doctors (Table 4). Nevertheless the statistical analysis has not confirmed any statistically significant differences between pain treatment applied by different entities, and age of children p>0.05.

Pain treatment and location of burns

In the case of 10 children burns covered 2 body areas, e.g. face and neck; neck and chest, etc., in the case of 4 children – one body area, e.g. hand, forearm, chest, in the case of 1 children – 3 body areas, and in the case of 1 patient the data was missing; multiple body area burns 2–3 and more body areas, in the case of 3 children – burns on one area, and in the case of 1 patient there was no information in this scope.

Pain treatment and burn depth

Among 16 children who received painkillers in the prehospital period, in the case of 10 the burn depth was defined as 1st and 2nd degree, and in the case of 6 children – as 2nd degree. The statistical analysis has not demonstrated any statistically significant differences between implementation of pain treatment and depth of a burn p> 0.05

Pain treatment and hospitalization of children with burns

Hospitalization was suggested, in accordance with commonly adopted principles, to 82 out of 193 children with burns (42.5%), (Figure 1).Upon analysis of pain treatment with distinction between children sent to hospital and outpatient clinic, it has been stated that 16 among 82 hospitalized children received painkillers (19.52%). Among those children, 5 children with burns received painkillers from medical rescue teams, and 11 – from parents.

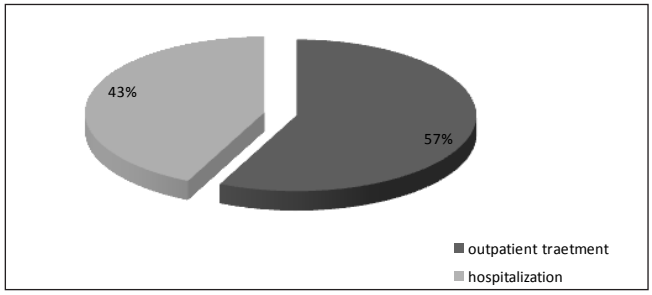

FIGURE 1. Type of treatment in the studied group.

In the group of patients hospitalized on account of their burns, pain treatment in the prehospital period was applied by medical rescue teams in the case of 5 children (6.07%). These were: 2 children with burns aged 3, one with burns on the neck and chest, and the second – on the chest; 2 children aged 6, one with burns on the chin, neck, and chest, one with burns on the forearm and chest, and 1 12-years-old child with burns on the shin and foot. Apart from 1 child with burns of the foot and shin, in the remaining 4 cases burns always covered chest. In the group of children qualified for outpatient treatment, in the case of 11 children out of 111 pain treatment was provided by medical rescue teams (7 children), and by family doctors (4 children). The remaining 19 children received painkillers from parents. The statistical analysis has not confirmed significant differences between qualification for treatment and the implemented pain treatment, p> 0.05.

Painkillers given to children with burns

Medical rescue teams provided the suffering children with the following painkillers:

- *pethidine* 0.5 mg/kg-1.0 mg/kg in 3 cases (boys aged 2 years and 1 month, 11, and 12 years, out of whom 2 were hospitalized, and 1 11-year-old boy was admitted to outpatient clinic due to lack of hospital treatment)
- *morphine* 0.1/kg – 1 child (boy – 2 of years and 4 months old qualified for treatment in outpatient clinic)
- *metamizole* in the form of a suppository – 4 children (13 months, 28 months and 2 children aged 5, the last couple qualified for hospital treatment)
- *paracetamol*, tablets – 3 children (12 months old, 8 and 17 years old, qualified for outpatient treatment)
- *paracetamol,* syrup – 1 child of undetermined age.

Painkillers given by family doctor:

- *metamizole* – 2 children (20 months, and 3 years and 9 months old, qualified for outpatient treatment)
- *paracetamol* – 2 children (19 months and 8 years, also qualified for outpatient treatment).

DISCUSSION

Despite the progress in burn therapy during the last 25 years, there are still some objections concerning organization of prehospital assistance and professional provision of premedical and medical first aid to persons suffering from burns in the place of occurrence. Most often critical comments refer to the lack of care over pain treatment in the case of children with burns in the prehospital period, and incorrect assessment of burn degree and improper liquid resuscitation [4,12,14,17-20]. The author's own studies confirmed these

observations. They proved that pain treatment was applied only in the case of half of children transported to the Ward by medical rescue teams, and 20% of children who visited family doctors after the accident occurred. Doctors from New Zealand observed at the same time that failure to initiate pain treatment correlates with the age of a child. These researchers explain failure to use painkillers in the case of small children suffering from burns by fear of their side effects [14]. Own observation has not confirmed the dependency between administering painkillers and children's age. Pain treatment was applied by medical rescue teams or family doctors only in the case of children above 1 year of age (16 children). Neither burn mechanism, nor its location or depth affected the decision about initiation of pain treatment. In the group of 82 children who, according to the valid recommendations, were qualified for hospital treatment, pain relief was granted only to 16 children, only in 5 cases by the medical rescue teams. The remaining 11 children were provided with painkillers by their parents. At the same time, in this group of patients 5 children were reported with symptoms of burn shock at the time of admitting to the Ward, which mainly resulted from the lack of pain treatment. No dependency has been observed in the analysis of the type of provided medicine and qualification for hospitalization. Selection of medicines to be used in the majority of cases was accidental, and it did not result from the burn degree. Ignoring the aspect of pain treatment by a number of rescue teams and family doctors probably relates to the lack of skillful evaluation of children's pain, no understanding of pain treatment, and lack of relevant skills among doctors and medical rescuers. Similar suggestions result from American research, which disclosed lack of skills of children's and youth's pain evaluation in the case of majority of paramedics/medical rescuers working in Emergency Wards, and lack of medical documentation containing information about administering analgesics [17]. Canadian research also revealed lack of skillful pain treatment and correct assessment of the extent and depth of burns indicated by a number of doctors working in Emergency Wards. These researchers pay attention to the need for continuous training of all employees working in Emergency Medicine [18].

Own study has also ascertained that the general knowledge of society on first aid provision to persons with burns is insufficient. Our observations indicate that first aid in the case of nearly half of the children (48.1%) was limited to removal of clothes soaked with hot liquid. Similarly, British research has confirmed that 1/3 of children with burns are admitted to Emergency Wards without prior assistance [12].

The conducted research has confirmed the opinion stating the lack of first aid skills in the case of persons sufferig from burns, and inadequate quality of prehospital medical assistance granted to children with burns.

On the basis of own research, it seems necessary to prepare a uniform algorithm for pain treatment in children with burns dependent upon the degree of burn, and intensified training of doctors, nurses, and rescuers with regard to pain treatment in children with burns.

REFERENCES

1. Wilkinson E. The epidemiology of Burns in secondary care in apopulation of 2.6 one million poeple. Burns. 1998;24:130-43.
2. S. Hettiaratcha, R.Papini P. Dziewulski. ABC of Burns, 1st Polish Issue, edited by Jacek Smerka, Wroclaw: Gornickie Wydawnictwo Medyczne; 2007.
3. Alson RL, Treat RC. In: John E.Campbella, Basic Trauma Life Support, 1st Polish edition. Kraków: Medycyna Praktyczna; 2006.p. 207-37.
4. Herndon DN, Spies M. Modern burn care. Semin Pediatr Surg. 2001;10(1):28-31.
5. Aoki BY, McCloskey K. A child in the lifethreatening state. Estimation, management, transport. Kraków: Medycyna Praktyczna; 1999. p. 247-53.
6. Daniel M, Borkowska M. The role of the emergency medicine in primary care in the traetment of children with burns The Annal of the Childish Traumatic Surgery. 2004;8 XXXII:99-101.
7. Osemlak P, Szczepińska-Sobótka J. The Emergency Medicine in children with Burns. The Annal of the Childish Traumatic Surgery. 2004;8(XXXI):117-23.
8. Puchała J, Strużyna J, Smolec-Zamora M. Epidemiology of thermal injuries in the materials of departments of treating burns and other spacialistic departments in Poland. The 60th Jubilee Congress of the Association of Polish Surgeons. Warsaw 12-15. 09. 2001; summaries, 156.
9. Skotnicka-Klonowicz G, Wysocka A, Kuzański W. The assesment of the quality of the primary and medical care in burns in children. In: Jakubaszko J, Postępy medycyny ratunkowej w Polsce. Bydgoszcz-Wroclaw, summer 2005, 105-11 Polish Society for Emergency Medicine/ SR-Poligrafia, Wroclaw
10. Skotnicka-Klonowicz G. The burns in childhood in perspective of the emergency medicine. In: Jakubaszko J. Polska Medycyna Ratunkowa Dzieciom – Summer 2007. Wroclaw; 2007. p.85-9.
11. Sokół-Kobielska E. The treatment of pain Part I. The introduction: pathophisiology, classification and assesment of pain. Pediatr Med Chapter. 2007;3(2):95-100.
12. Rawlins IM, Khan AA, Shenton AF,et al. Epidemiology and outcome analysis of 80 children with burns attending an emergency department. Pedatr Emerg Care. 2007;23(5): 289-93.
13. Skotnicka-Klonowicz G, Szczepańska W. The Knowledge of first aid giving among students of grammar and post-grammar schools in the selected parishes of Opolian province. In: Jakubaszko J. Emergency Medicine in Poland 2008. Wrocław; 2008. p. 221-6.
14. Watkins N. Paediatric prehospital analgesia in Auckland. Emerg Med. Australas. 2006;18(1):51-6.
15. Kobylarz K, Szlachta-Jezioro I. The treatment of pain in children. In: Dobrogowski J, Wordliczek J. The medicine of pain. Warszawa: PZWL; 2004. p. 577-97.
16. Shakespeare PG. Standards and quality in burn treatment. Burns. 2001;8(27):791-2.
17. Hennes H, Kim MK, PirralloRG. Prehospital pain management: a comparison of providers erceptions and practices. Prehosp Emerg Care. 2005;9(1):32-9.
18. Bezuhly M, Gomez M, Fish JS. Emergency department management of minor burn injuries in Ontario, Canada. Burns. 2004;30(2):160-4.
19. Hagstrom M, Wirth GA, Evans GR, et al. A review of emergency department fluid resuscitation of burn patients transferred to a regional, verified burn center. Ann Plast Surg. 2003;51(2): 173-6.
20. Puchała J. Wczesne postępowanie w oparzeniach u dzieci . In: Strużyna J. Wczesne leczenie oparzeń. Warszawa: PZWL; 2006. p. 259-73.

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