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Care Seeking Behaviour of orthopaedic injuries and fractures and it's outcomes in Eastern India: A tertiary care hospital-based study

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Abstract

Background: *Orthopedic injuries or fractures among adults are a serious public health issue due to the rising incidence of high speed road traffic accidents in India. Selecting a treatment approach and a facility to get treated from, poses a challenge in musculoskeletal injuries in India. In low resource settings like India, availability and timely access to surgical care facility is crucial for fracture management.*

Materials & Methods: *The purpose of this study was to explore the processes in decision-making following a fracture in an adult person, identify cause for delays in obtaining care, and the potential barriers and facilitators to seeking appropriate care in time.*

Results: *In assessing such Health seeking behaviour in the present study we found that a considerable percentage of patients (21.5%) sought their first medical attention to Quacks and local doctors (23%) who may be a qualified doctor or a so called Registered Medical Practitioner (RMP) and 31.7% of patients attending quack had poor outcome as compared to19.5% for local doctors whereas 36.8% of patients attending our hospital (NBMC&H) had excellent outcome (p=0.020).*

Conclusion: *This study provides important information on issues beyond the need for in-hospital care pathways and evidence-based protocols for the management of older adults with fractures in India. The findings show huge difficulty of patients with fractures in having access to hospital care, from the pre-hospital services to hospital admission and surgery—which demands improvements in the entire Indian healthcare system.*

Keywords: *Care seeking, Behavior, Fractures, Orthopedic injuries.*

Introduction

The Anderson and Newman framework states that health service utilization is governed by three main factors: predisposition, enablement and perception of need for care.[1] Road traffic injures (RTIs) are responsible for a substantial proportion of deaths and injuries and are responsible for more years of life lost than most human diseases. Human behavior factors, vehicle factors, and road factors contribute to the causation of road traffic crushes.[2] Injuries due to trauma have rapidly been increasing in number worldwide, particularly in low- and middle-income countries (LMICs) such as India.[3,4] This is partially due to the rapid motorization over the past 2 decades. Excessive speed, nonusage of helmets, driving under the influence of alcohol, and poor road design and infrastructure-related factors are some major risk factors for the increasing number of road traffic accidents.[5,6]

As per the first global status report on road safety of the World Health Organization (WHO), India has the highest number of deaths due to road traffic accidents, with 375 deaths and more than 1200 injuries per day due to road accidents in the country.[5] Trauma is projected to be third largest killer in the developing world by 2020, with a large number of these injuries comprising of spine trauma and traumatic spinal cord injury.[7, 8]

Poeple seeking medical attention often reaches our institution (North Bengal Medical College and Hospital) few days to several weeks and even several months after sustaining trauma. The possible factors for the unwanted delays which leads us to treat the so called neglected fractures by and large may be ignorance about the need for urgent treatment and ignorance in general, poverty, distance from the site of occurrence to the referral centre(hospital), unavailability of means of transport even during busy hours of the day, not to mention about the scenario after sundown, treatment by untrained Osteopaths (who call themselves as "Bone Setter"), Ayurved doctors, Homoeopaths and lastly by quacks on whom people rely heavily. Moreover due to some infrastructural constraints from our part we are unable to deliver the definitive management in appropriate time frame which further adds on to the delay and in quite an appreciable number of cases fresh fractures are thus being converted to neglected fractures even if the patients come to us in the right time frame. Thus most of the times we come to treat neglected fractures.

The presence of a large number of untrained (self acclaimed) osteopaths who (mal) treat an appreciable number of fracture patients resulting in complications of a neglected fracture namely non-union, malunion, infection, joint contractures, stiffness and soft tissue damage adds to the burden of handicapped people in the society.

India does not have a universal healthcare system for all its citizens. Most healthcare expenses are paid out of pocket by patients and their families, rather than through insurance. According to the National Family Health Survey-3, the private medical sector remains the primary source of healthcare for 70% of households in urban areas and 63% of households in rural areas. But for poor and vulnerable people, the public sector remains the healthcare system to access as they cannot afford private medical care. Moreover, there is no public pre-hospital care for trauma in India. Rashtriya Swasthaya Bima Yojana (RSBY), a health insurance scheme, initially launched for below poverty line (BPL) households, now covers other defined categories of unorganized workers.[9] But this community insurance scheme covers only a proportion of the population and defined diseases requiring hospitalization. Besides, the implementation of this scheme is varied in nature across different states in India.[9, 10] Early adoption of best practice guidelines and protocol-based care in low- and middle-income countries may have the potential to reduce the risk of mortality and cost of care and improve quality of life for older adults with hip fracture.

Aims and Objectives

The objectives of the study was

1. To find out the demographic profile of the study population.
2. To study the health seeking behaviour of patients regarding their first contact physicians.
3. To find out the possible causes of delay from the institutional side in delivering early definitive intervention to the patients.

Materials and Methods

The study was conducted in the Department of Orthopaedics, North Bengal Medical College and Hospital, on a prospective basis from June 2011 to June 2012.Out of the patients admitted in Department of Orthopaedics, NBMC&H, since June 2011 to December 2011,135 patients were chosen according to inclusion criteria for the study and followed up for 24 weeks after they received definitive intervention. The study was conducted after getting necessary departmental permission, Institutional ethical committee permission along with informed consent from the study population.

One hundred and thirty five patients were included for the above study. Patients attending and getting admitted from the Out Patient Department and casualty of NBMC&H with the diagnosis of a traumatic fracture were studied.

Data was analyzed using SPSS (ver. 19, Chicago Inc) after entering into the MS Excell data sheet (Microsoft Corporation, USA). Descriptive statistics along with nonparametric and parametric tests were applied where necessary at 95% confidence interval considering P value 0.05 as level of significance.

Results

The distribution of the age of the study population was, mean 32.06 (SE 1.442) years. Injury to admission interval mean is 9.56 days (SE 0.635), and injury to definitive management interval mean is 19.43days (SE 0.999) [Table 1].

Table 1: Demographic profile of the study population

Variables	N	Minimum	Maximum	Mean		Std. Deviation
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
Age	135	2	72	32.06	1.442	16.754
Injury to admission interval	135	0	36	9.56	0.635	7.374
Injury to definitive management interval	135	0	55	19.43	0.999	11.610

Table 2: Frequency of fractures in males and females

Sex	Frequency	Percentage
Female	43	31.9
Male	92	68.1
Total	135	100

The above table shows that the distribution of fractures in the study population according to sex were male 68.1% and female 31.9% respectively [Table 2].

Table 3: Managements given by the First Contact Physicians

Management	Frequency	Percentage
Sling	8	5.9
Bed rest	15	11.1
Indigenous	45	33.3
Pop slab	35	25.9
Splint	17	12.6
Traction	15	11.1
Total	135	100

Of the managements delivered, indigenous treatment was given in most cases (33.33%) [Table 3].

Table 4: Health seeking behaviour of the patients: First Contact Physicians

First Contact Physician	Frequency	Percentage
Ayurved	10	7.4
Bone setter	6	4.4
District hospital	17	12.6
Tertiary Care Teaching Hospital nearby state	1	0.7
Local Doctor	31	23
NBMC&H [Study site]	39	28.9
Osteopath	2	1.5
Quack	29	21.5
Total	135	100

Above table shows that most of the patients sought first medical attention at our institution

(28.9%) but a considerable number went to quack (21.5) and local doctors (23.0%) too [Table 4].

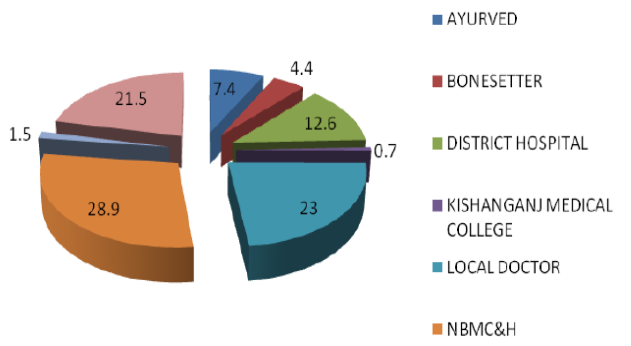

Figure 1: Health seeking behaviour of the patients: First contact physicians

Table: 5 Frequency of definitive management delivered

TYPE OF DEFINITIVE MANAGEMENT	Frequency	Percent
CHS	1	.7
CR POP CAST	10	7.4
CRIF	19	14.1
CYLINDER CAST	1	.7
EXCISSION	1	.7
GALLOWS TRACTION	1	.7
HEMIARTHROPLASTY	6	4.4
HIP SPICA	2	1.5
INTERLOCKING NAIL	9	6.7
JESS	1	.7
MPBG	1	.7
ORIF	67	49.6
POP CASING	9	6.63
PROXIMAL FEMORAL NAILING	1	.7
TENS	3	2.2
TRACTION	3	2.2
Total	135	100.0

[CHS: cannulated hip screw, CR POP CAST: closed reduction and plaster of paris cast. CRIF: closed reduction and internal fixation, EXCISSION: excision of radial head, JESS: Joshi's external stabilisation system, MPBG: muscle pedicle bone grafting ORIF: open reduction and internal fixation, POP CASING: plaster of paris casing TENS: titanium elastic nail system]

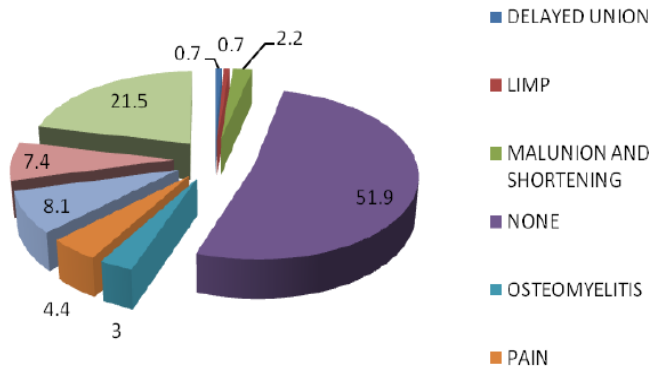

Figure 2: Frequency of complications

Figure 3 shows that the outcome measure was poor in 30.4% and satisfactory in 7.4% respectively. Most of the patients had no complications (51.9%) but amongst others, stiffness was the most common complication (21.5%).

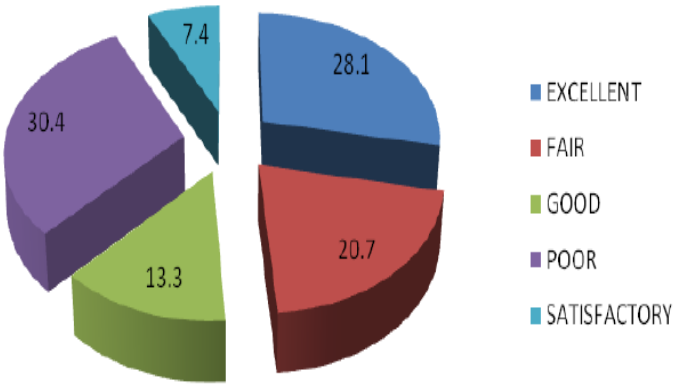

Figure 3: Frequency of outcomes

Table 6: Frequency of fractures

Fractures	Frequency	Percentage
Proximal Humerus	2	1.5
Shaft Humerus	3	2.2
Around Elbow	29	21.5
Forearm	14	10.2
Around Wrist	11	8.1
Proximal Femur	24	17.8
Shaft femur, tibia and fibula	30	22.3
Around Knee	14	10.3
Around Ankle	6	4.4
Hind foot	2	1.5
Total	135	100

The distribution of fractures is shaft of femur, tibia and fibula is 22.3% and hindfoot and proximal humerus fractures accounted for 1.5% respectively. Proximal humerus is, shaft humerus, fractures around elbow (which includes supracondylar humerus, intercondylar humerus, capitellum, radial head, olecranon, coronoid process of ulna), forearm (shafts of radius and ulna), Fractures around wrist (distal radius, ulna and carpal bones, proximal femur (includes intertrochanteric, neck femur and subtrochanteric fractures, shaft of femur,tibia and fibula accounts ,fractures around ankle (bimalleolar, trimalleolar, pilon, fractures around knee (patella, supracondylar femur and tibial plateau) and hindfoot (talus and calcaneus) [Table 6/Figure 4].

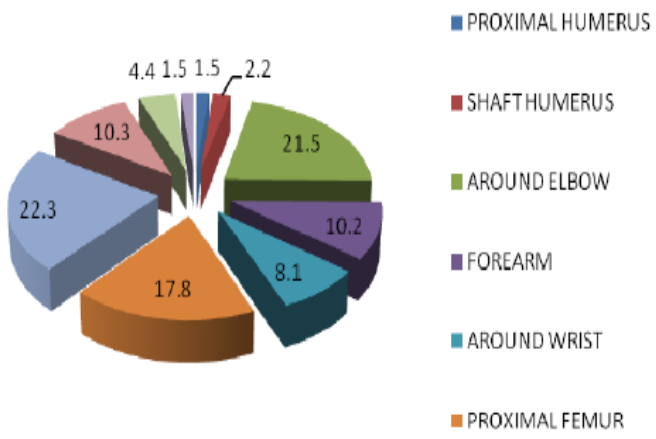

Figure 4: Frequency of fractures

Study shows that the mean difference of injury management interval according to outcome are statistically significant p=0.000 (P < 0.05, F stat=20.273). Study reveals excellent outcome in mean of 6.66 (95% CI) days of admission to injury interval and poor outcome in mean 14.45 (95% CI) days of the same, which is statistically significant p=0.000 (p=<0.05and F stat=9.791). It shows that the mean difference from excellent outcome to poor outcome with regard to the injury to definitive management intervals are statistically significantly P=0.000 (95% CI). It also shows that the mean difference between excellent outcome and poor outcome with regard to the injury to admission interval is statistically significant P=0.000 (95% CI).

Table 7: Outcomes related to first contact physicians

Outcomes		First Contact Physician								Total	Chi-square Tests
		AYURVED	BONESETTAR	DIST. HOSP.	MGMC&H	LOCAL DOCTOR	NBMC&H	OSTEOPATH	QUACK		
Excellent	Count	1	1	3	0	13	14		6	38	
	% within remark	2.6%	2.6%	7.9%	0.0%	34.2%	36.8%	0.0%	15.8%	100.0%	
Good	Count	2	0	2	0	6	6	0	2	18	
	% within remark	11.1%	0.0%	11.1%	0.0%	33.3%	33.3%	0.0%	11.1%	100.0%	
Satisfactory	Count	0	0	1	1	1	7	0	0	10	
	% within remark	0.0%	0.0%	10.0%	10.0%	10.0%	70.0%	0.0%	0.0%	100.0%	
Fair	Count	2	2	6	0	3	6	1	8	28	
	% within remark	7.1%	7.1%	21.4%	0.0%	10.7%	21.4%	3.6%	28.6%	100.0%	
Poor	Count	5	3	5	0	8	6	1	13	41	
	% within remark	12.2%	7.3%	12.2%	0.0%	19.5%	14.6%	2.4%	31.7%	100.0%	
Total	Count	10	6	17	1	31	39	2	29	135	
	% within remark	7.4%	4.4%	12.6%	0.7%	23.0%	28.9%	1.5%	21.5%	100.0%	

Value 45.52 Df 28 P value 0.020

Above table 7 shows that patients who went to Quacks had a poor outcome (31.7%) whereas those who attended NBMC&H had (36.8%) excellent outcome and the differences are statistically significant (X2 =45.52, df=28 P< 0.05).

Discussion

In the present study, the age distribution in the study population was, mean 32.06(SE 1.442) years and the sex distribution of the study population shows that 31.9% of the fracture patients were female and 68.1% were males respectively. Many of the developing countries like ours where surgical fracture treatment by implants bears a considerable financial burden, the

patients in general, especially those who lives in a remote area from our hospital and are daily labourers, who in our study population comprises the majority, seeks first medical attention elsewhere, especially quacks, bonesetters, ayurveds etc.[11]

In the present study these First Contact Physician with their treatment methods plays a vital role in the ultimate functional outcome. In assessing such Health seeking behaviour in the present study we found that a considerable percentage of patients (21.5%) sought their first medical attention to Quacks and local doctors (23%) who may be a qualified doctor or a so called Registered Medical Practitioner (RMP) and 31.7% of patients attending quack had poor outcome as compared to19.5% for local doctors whereas 36.8% of patients attending our hospital (NBMC&H) had excellent outcome (p=0.020). Amongst the various managements delivered, indigenous treatment like vigorous massage with egg white, oil and application of herbal liniments at fracture site was given in 33.3% of cases by quacks and other non qualified professionals and Pearson Chi-Square analysis showed that people who went to quacks had a poor outcome in 31.7% and those who attended NBMC&H had excellent outcome in 36.8% and this difference is statistically significant. ($X2 = 45.52$, $df=28$ $P< 0.05$).

Amongst complications pain with stiffness, and stiffness alone were very common (21.5% and 8.1% respectively) at the end of 24 weeks follow up and is due to delay either at presentation or in delivering definitive treatment, 51.9%of patients had no complications because either they received early definitive fixation in the emergency operation theatre or due to early presentation to us. For similar reasons excellent functional outcome was seen in 28.1% cases ,fair in 20.7%,good in 13,3%,satisfactory in 7.4%,and poor in 30.4% cases.

Delayed union and limp were present in 0.7% respectively, malunion and shortening in 2.2%, post operative osteomyelitis in 3%,pain and painful limp in 4.4% and 7.4% respectively. These complications were in part due to the delay at presentation to us and various factors contributing to it and for those who presented to us in time but for the infrastructural limitations we were unable to deliver definitive treatment, which led into the conversion of a fresh fracture into a neglected fracture.

Intraarticular fractures should be fixed within 48 to 72 hours, if this is delayed for2 to 3 weeks, for any reason like the general condition of the patient precluding anaesthetic fitness or other medical issues, results are seldom good with increased rates of complications like stiffness, increased risk of heterotopic ossification and thus resulting in worse outcomes.[12,13,14]

We also found that the mean difference from excellent outcome to poor outcome with regard to the injury to definitive management intervals is statistically significantly. P=0.000(95% CI), and similarly that the mean difference between excellent outcome and poor outcome with regard to the injury to admission interval is also statistically significant P=0.000(95% CI).

Patients and general population in our study area are mostly from poor socioeconomic status and are daily wage earners. Most of them lives so remote from our institution that quacks, bonesetter becomes the first port of call in most cases; obviously lack of education is also by and large equally responsible. Fracture managements are still not a part of basic health care programmes at the grass root level like immunization, had this been possible our medical colleges wouldn't have been overburdened like anything. Medical colleges lacks standard setup as recommended by the international organisations and thus the infrastructural deficits and the resultant delay, along with the overburdened condition refrains us from treating fractures within the recommended time frame creating iatrogenic neglected fractures. In transit delays from the injury site to our center is also a major concern. Certain demographic indicator paints a more realistic picture of the health indicators of rural India.

Indian census estimates adjusted for educational qualifications reveal that the health worker density (including doctors, nurses and midwives) is approximately 8 per 10,000 population (PHFI 2008), well short of the suggested norm of 25 per 10,000 (WHO 2006). Most (60%) health workers are present in urban areas where 28% of the population resides (PHFI 2008).[15] This rural bias is consistent across cadres of health workers; 40% of allopathic physicians, nurses and midwifes, AYUSH practitioners and 20% of dentists are present in rural areas. This is reflected in the low health worker density of 11 per 10,000 populations in rural (urban) areas. However, 56.4% of all health workers were unqualified, including 42.3% of allopathic doctors, 27.5% of dentists, 56.1% of Ayurveda, yoga and naturopathy, Unani, Siddha and homoeopathy (AYUSH) practitioners, 58.4% of nurses and midwives and 69.2% of health associates. By cadre, there were 3.3 qualified allopathic doctors and 3.1 nurses and midwives per 10 000 population; this is around one quarter of the World Health Organization benchmark of 22.8 doctors, nurses and midwives per 10 000 population. Out of all qualified workers, 77.4% were located in urban areas, even though the urban population is only 31% of the total population of the country. This urban-rural difference was higher for allopathic doctors (density 11.4 times higher in urban areas) compared to nurses and midwives (5.5 times higher in urban areas).[15]

Timely access to surgical care is therefore essential for reduction of mortality and morbidity associated with hip fracture injury.[16] However, access to safe, affordable surgical and anesthesia care in a developing country like India is a big challenge, where nine of ten people cannot access basic surgical care.[16] Recently published hip fracture audit conducted in Odisha indicates high numbers of conservative treatment and great delays in surgery.[17] Often, patients turn to traditional health practitioners, as they are easily accessible, trusted and cheap compared to modern medical care.[18, 19] Studies have shown that about 70% of primary health care needs of the Indian population are met with traditional medicine and similar trends are observed in other parts of Asia such as China, Thailand and Indonesia.[20] Currently there is a paucity of information on the pathways of care and outcomes of older individuals with hip fractures in India.

In low resource settings like India, availability and timely access to surgical care facility is crucial for hip fracture management. The "three delay" model developed to assess delays in accessing timely obstetric care provides a framework to understand the causes for delay between sustaining a hip fracture and receipt of appropriate care.[21, 22] The First Delay-associated with decision-making to seek care is influenced by financial and geographic restrictions, family hierarchy, cultural beliefs, poor education, a low awareness of available services or low confidence in those services. The Second Delay - in reaching care - occurs when hospitals with surgical capacity are scarce or far away and inadequate transportation facility. Access to private vehicles, ambulance service and public transport is not uniform across the state. The Third Delay - the delay in receiving care occurs when attendance at a hospital does not guarantee treatment.[11, 23, 24]

We acknowledge that we could not incorporate the perspective of patients and their carers on pain, mobility and functional status in this study. This is a major limitation of the study. The study findings cannot be generalized to private sector hospitals with better infrastructure and human resource or to regional public hospitals with significantly limited capacity compared to the burden of injuries and poor health systems. The study does not provide information on incidence, as the denominator for fractures reporting to hospital was unavailable. A larger multicentre prospective cohort study would be required to understand the incidence of fracture in the adult population in India.

Conclusion

Every institution should be standardised in order to maintain uniformity in delivering treatment. To assess outcome we need to deliver the treatments in a set up which meets international standardisation, then only we can compare the results with that of western literatures. Our Operation theatre does not meet the standard of a tertiary care center. We are being driven by circumstances to perform an operation (due to various before mentioned reasons) that finds no place in the standard texts of latest editions. We do not have the state of the art diagnostic facilities like intraoperative cultures, frozen section analysis for histopathology not to mention about the availability of PCR and others. We have to solely rely upon strict asepsis of surgeons and parenteral antibiotics from our part to prevent infections. Apart from these confounders there are others such as the personality of the fracture, site of the fracture, other systemic effects of trauma such as malnutrition, pulmonary and gastrointestinal dysfunction, immunologic and neurological injury, preoperative co-morbidities like cardio-respiratory and renal compromise, age and general condition of the patient, i.e. whether the patient is diabetic or hypertensive or smoker.

Timing and duration of the surgery, per operative blood loss, training and expertise of the operating surgeon, soft tissue handling, reduction techniques employed and choice of the implants are amongst them. Similar study taking into account all these above mentioned factors should be conducted in this region in future. We feel that efforts from the state and national levels should be directed upon improving the socioeconomic status of these people, improve the level of education so that people can afford as well as understand the importance of urgent facture treatment ,an aim which our government has reached in cases of immunisation programmes.

An immediate pick up facility to bring these injured patients from the site of injury to our institution is very essential in preventing such poor outcomes. Infrastructural improvements should be made in Medical Colleges as per recommended standards so that post graduate trainees and faculty could work effectively in bringing the desired results. At least a separate orthopaedic operation theatre equipped with image intensifier, with a dedicated anaesthetic team along with nurses in the Emergency theatre will also help treat fracture urgently and thus will reduce the total case load in the elective OT.A strict vigilance at the Handicapped board of the institution is mandatory and every effort should be directed to reduce the handicapped burden to our society.

Our Government has realized lately that improvements has to be made and has funded our institution adequately, it's our duty to ensure that proper implementation and adequate planning should be undertaken to utilise the fund effectively. New trauma center is under construction and hopefully it will be functional shortly. Doctor population ratio is currently 1:2000 so are the number of specialized doctors. The numbers of post graduate seats have also increased exponentially in the past 3 years. Government has also constructed many new Medical colleges in our state which are functional and are on the way of opening many new ones as for example in Jalpaiguri. Sub-divisional Hospitals are being planned to be upgraded to Medical Colleges which when functional will reduce case load upon the tertiary care centers.

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