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Association of chronic pain with the use of health care services by older adults in Sao Paulo

ABSTRACT

OBJECTIVE: Evaluate the association between use of health care services by older adults with chronic pain and sociodemographic and health variables.

METHODS: Cross-sectional study whose population sample of 1,271 older adults with chronic pain and with no cognitive deficit was obtained through home surveys in Sao Paulo, SP, Southeastern Brazil,, in 2006. The study considered pain lasting for six or more months as chronic. The criterion for health care service use was more than four doctor appointments or having been admitted to a hospital during the past year. For those in chronic pain for at least one year, the existence of an association between the use of health care services and independent variables (pain and socio-demographical characteristics and self-reported morbidities) was tested using univariate (RaoScott test of association) and multivariate analysis (Cox Multiple Regression with robust variance). Stata 11.0 was used for the statistical analysis, and the significance level adopted was $p < 0.05$.

RESULTS: The prevalence of health care service use among older people with pain was 48,0% (95%CI 35.1;52.8) and did not differ from older adults without chronic pain (50.5%, 95%CI 45.1;55.9). The multivariate analysis showed that the chance of using health care services was 33,0% lower for older adults with pain for more than two years than those with pain between one and two years ($p = 0.002$). The chance was 55,0% higher for those with intense pain ($p = 0.003$) and 45,0% higher for those with moderate pain interference in the work ($p = 0.015$).

CONCLUSIONS: Chronic pain was found to be common and was associated with negative effects on independence and mobility. More intense and recent chronic pain that affected work resulted in greater use of health care services.

DESCRIPTORS: Aged. Chronic Pain, epidemiology. Health Services, utilization. Cross-Sectional Studies. Study SABE.

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INTRODUCTION

The ageing population has caused changes in the demand for health care services. Disease of the older population consumes more resources, leads to more hospitalizations and their duration is longer, compared with those of other age groups.[10,11,18,23]

There are many reasons behind the use of health care services by older individuals. These include factors concerning the individual and the structure of the services provided, as well as factors concerning the social environment in which the older individual lives. Identifying the factors which influence this demand may help in proposing suitable public policies.

Little is known about the extent to which chronic pain in older individuals influences the use of the services, as it is rarely recorded in official health care statistics. Pain can be associated with chronic pathological processes, which last for months or years, or to the variety of diseases that affect older adults and may be the source of chronic pain. Chronic pain is defined as that which persists beyond the time reasonably expected for the healing of the injury, or pain that lasts for more than six months, according to the criteria established by the International Association for the Study of Pain (IASP).[a,b]

Pain is often the cause for use of health care services by individuals of all ages and in all parts of the world,[3,5,12,15-17,19,21,22] and individuals suffering from chronic pain make more use of these services compared with other patients.[1,2,6,12]

Pain is the motive for using emergency health care services,[5] primary health care services[7,12,17] and consultations.[1,7,15,16] However, decreases in the use of these services is associated with serious depression.[7]

Among the older population, pain is one of the causes of seeking health care at all levels of the service. But there is little that can be concluded about which characteristics of pain are most burdensome for the health care services, especially for the older population in Brazil.

Venturi et al[22] and Rosa et al[7] identified pain as the most frequent complaint in the older individuals who used the Brazilian Unified Health System. Another study analyzed the presence of chronic pain and health care service use by 7,000 older individuals who were interviewed about sleep disturbances and pain complaints, and showed that it was those individuals who suffered from pain and insomnia who had the most consultations and hospitalizations.[1]

There are issues which need to be clarified, such as which characteristics of chronic pain affect health care service use by the older population living in the community, or what personal, socioeconomic and health characteristics are possessed by the older individuals with chronic pain who make the most use of health care services.

The aim of this study was to analyze the association between health care service use among older adults suffering from chronic pain and sociodemographic and health variables.

METHODS

This was a cross-sectional population based study. The data came from the *Saúde, Bem-estar e Envelhecimento* (SABE – Health, Well-Being and Ageing) project, which aimed to identify the health and living conditions in older individuals resident in seven cities in Latin America and the Caribbean. The SABE is a longitudinal study, with data collected in 2000, 2006 and 2010. The data analyzed were from 2006, when questions about chronic pain were included.

The sample of the 2006 survey was made up of the surviving older individuals who had participated in the 2000 survey, who were re-interviewed (n = 1,115) and individuals aged 60 to 64, who composed a new cohort representing the 60-64 year old population in the municipality of Sao Paulo, SP. New weighting was carried out, allowing these two samples to be combined, resulting in 1,413 individuals in 2006. Details on the sampling technique can be found in Silva et al[20] (2003) and Lebrão & Laurenti[9] (2005). The diagram summarizes the composition of the sample of individuals interviewed in 2006 and included in the analyses in this article (Figure 1). Considering the subjectivity of pain, it was decided not to include individuals with cognitive deficiencies in the analyses.

The older individuals, totaling 1,271, had a mean age of 69.5 (SE = 0.6), the majority (59.5%) were women, did not work (68.3%), had between one and four years of schooling (59.4%) and did not live alone (86.6%). The most common household income was between one and three minimum wages (42.8%).

The dependent variable "use of health care services" was measured by the presence of one hospitalization lasting at least one day, and by having requested more than four consultations in the preceding 12 months.

Outpatient care and primary care consultations were included. Given the high prevalence of high blood

[a] Merskey H, Bogduk N. Classification of chronic pain: descriptions of chronic pain syndromes and definitions of pain terms. 2 ed. Washington (DC): Internacional Association for the Study of Pain; 1994.
[b] International Association for the Study of Pain. IASP-Taxonomy. Proposed Taxonomy Changes. Washington (DC); 2008:1-4 [cited 2012 Jan 24]. Available from: http://www.iasp-pain.org/AM/Template.cfm?Section=Home&Template=/CM/ContentDisplay.cfm&ContentID=6633

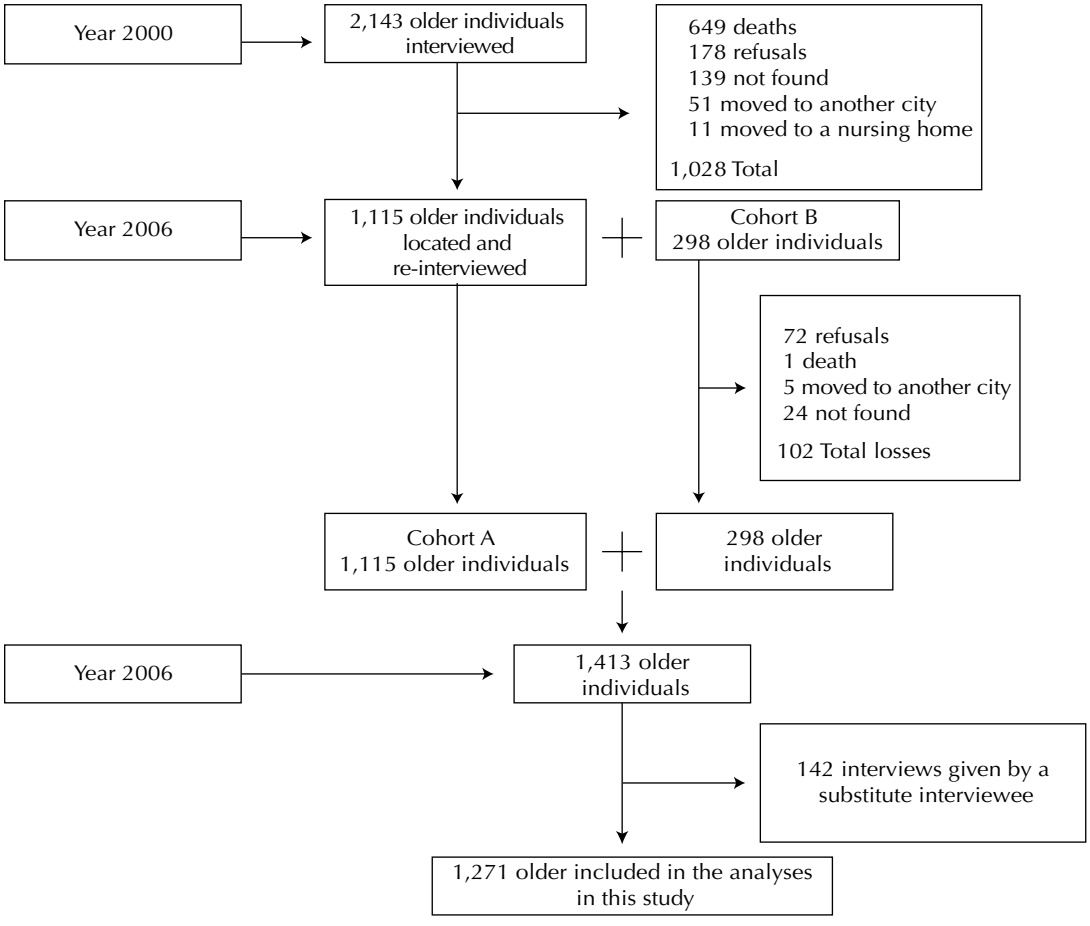

Figure 1. Diagram of the sample and losses. SABE study,[20] Sao Paulo, SP, Southeastern Brazil, 2000-2006.

pressure and diabetes among the older population, and that programs[c,d,e] recommend three to four consultations per year for these diseases, more than four consultations/year was considered the cutoff point for analyzing use of health care services potentially related to pain.

Two subgroups were created for the analyses: older individuals with up to four consultations/year and with no hospitalization during the period, and those with more than four consultations/year or with at least one hospitalization during the period.

Older individuals suffering from pain for more than 12 months were selected for analyses of the outcomes of use of health care services, as issues concerning health care service use investigated episodes in the preceding 12 months.

The independent variables used were: sociodemographic characteristics; presence of pain and chronic pain; chronic pain was characterized as that which most discomfited the older individual, and was characterized according to location, duration, intensity and frequency; depression; self-reported disease; functional capacity, evaluated based on activities of daily living (basic and instrumental); assessment of mobility; interference caused by pain, assessed using the SF12 quality of life scale, by the question: "During the last four weeks (the last month), to what extent has the presence of pain interfered with your normal work?" (including work within and outside of the home). The categories of analysis were: not at all; a little/moderately and quite a lot/extremely.

In the univariate analysis the relationship between the outcome "use of health care services" and the

[c] Governo do Estado de São Paulo. Secretaria de Estado da Saúde. Assessoria Técnica do Gabinete do Secretário. Documento Linha do Cuidado - Diabetes – Quadro Sínteses – Atenção na Unidade Básica de Saúde. São Paulo; 2010 p. 29. [cited 2011 Dec 25]. Available from: http://www.saude.sp.gov.br/ses/perfil/cidadao/areas-tecnicas-da-sessp/hipertensao-arterial-e-diabetes-mellitus/linhas-de-cuidado-sessp/hipertensao-arterial-sistemica/documento-da-linha-de-cuidado/quadros-sinteses

[d] Governo do Estado de São Paulo. Secretaria de Estado da Saúde. Assessoria Técnica do Gabinete do Secretário. Documento Linha do Cuidado - Diabetes – Quadro Sínteses – Atenção na Unidade Básica de Saúde. São Paulo; 2010 p. 2. [cited 2011 Dec 25]. Available from: http://www.saude.sp.gov.br/ses/perfil/cidadao/areas-tecnicas-da-sessp/hipertensao-arterial-e-diabetes-mellitus/linhas-de-cuidado-sessp/diabetes-mellitus/documento-tecnico-da-linha-de-cuidado/quadros-sinteses

[e] Mion Jr D, Kohlmann Jr O, Machado CA, Amodeo C, Gomes MAM, Praxedes JN, et al. Diagnóstico e Classificação. In. Sociedade Brasileira de Hipertensão. V Diretrizes Brasileira de Hipertensão. São Paulo; 2006. p. 7-13.

independent variables was analyzed using the Rao & Scott[13] test of association for complex samples. Variables with $p < 0.25$ were included in the multiple analysis. Prevalence ratios obtained using Cox's regression (with robust variance) were analyzed.

The data were analyzed using the Stata 11.0 program (StataCorp LP, College Station, Texas, USA). The Rao & Scott[13] test of association, which considers the sample design, was used to analyze the relationship between the outcome variables (use of health care services) and the possible independent variables.

The project was approved by the Research Ethics Committee of the *Faculdade de Saúde Pública, Universidade de São Paulo* (Process COEP/83/06 March 14, 2006).

RESULTS

Pain was most frequently reported in women ($p < 0.007$). The intensity of the pain was associated with household income ($p = 0.005$): 37.0% of the older adults with household income ≥ 3 minimum wages reported mild/moderate pain and 17.0% intense pain, whereas in individuals with income ≤ 1 minimum wage, 20.9% reported mild/moderate pain and 42.7% intense or very intense pain. The other sociodemographic variables did not prove to be significantly associated with the presence of pain.

The presence of individuals suffering from pain for more than one year was 26.9% (95%CI 22.8;31.1); the percentage of those with more than four consultations in the last year and/or at least one hospitalization was 48.6% (95%CI 43.8;53.4). Use of health care services by the older adults suffering from pain for at least one year was 44.0% (95%CI 35.1;52.8) and there was no difference when compared with service use by individuals not suffering from pain (prevalence: 50.5%; 95%CI 45.1;55.9; $p = 0.190$).

No association was found between the sociodemographic variables and suffering from pain for one year or more and the use of health care services (Table 1).

Pain lasting for a longer time was a protection factor for health care service use. Individuals with mild or moderate pain used health care services less than those with more intense pain.

Older adults both with and without chronic pain showed a high prevalence of disease (Table 2).

Asthma was the complaint that showed the greatest trend for risk of using health care services by older individuals suffering from pain (PR = 1.53; 95%CI 1.14;2.04) ($p = 0.005$).

Degree of dependence did not affect the frequency of health care service use among older individuals suffering from pain (Table 3). However, individuals with moderate interference by pain in their work had a 52.0% higher risk of using health care services compared with those whose daily work activities were not affected by pain.

The variables inserted into the multiple analysis were: duration of the pain, asthma, intensity of the pain, interference with work, household income, hypertension, cerebral embolism, cataracts, age, urinary incontinence, sex, fecal incontinence and osteoporosis (Table 4).

The likelihood of using outpatient and/or hospital services was 33.0% lower for an older individual who had been suffering from pain for more than two years, compared with an individual suffering from pain for between one and two years ($p = 0.002$). Those with strong, intense and very strong, very intense pain had a 55.0% greater likelihood of using health care services compared with those with mild, medium or moderate pain ($p = 0.003$). Those who experienced moderate interference from pain in their normal work had a 52.0% greater likelihood of using health care services compared with those who experienced no such interference ($p = 0.015$).

The other variables which were statistically significant in the univariate analysis did not maintain the same significance in the final model.

DISCUSSION

There was no significant use in the use of health care services by older adults with and without chronic pain. The principal hypothesis is that the older individuals in

Table 1. Prevalence of health care service use according to characteristics of chronic pain of more than one year duration. Sao Paulo, SP, Southeastern Brazil, 2006.

Variable	Prevalence	PR	95%CI	p
Duration of pain (years)				0.002
1 to 2	61.4	1		
More than two	40.9	0.67	0.52;0.85	
Location				0.980
Lower limbs (MMII)	44.7	1		
Lumbar region (below the waist)	43.8	0.98	0.67;1.43	
Other	43.2	0.97	0.69;1.35	
Intensity				0.013
Mild/medium/ moderate	35.8	1		
Strong/intense/very strong /very intense	52.8	1.47	1.09;2.00	
Frequency of episodes				0.388
Almost every day	43.1	1		
Once or twice a week	44.8	1.04	0.70;1.54	
Once a fortnight	34.6	0.80	0.44;1.47	
Once a month	52.9	1.23	0.91;1.65	

question had a variety of diseases, which constituted a risk of elevated use of health care services. In addition, chronic pain, defined based on the criteria of duration may include different painful conditions, with differing degrees of severity. The size of the sample analyzed in the use of health care services may have influenced the statistical analyses, impeding other associations from being proved.

Studies analyzing the risk factors for the use of health care services by the older population state that complaints of pain is one of the most important factors.[5,15,16,19]

Table 2. Distribution of diseases self-reported by the older adults, according to presence of chronic pain. Sao Paulo, SP, Southeastern Brazil, 2006.

Variable	Pain for 6 months or more		p
	No (%)	Yes (%)	
Symptoms of depression			0.009
No	35.9	26.0	
Yes	64.1	74.0	
Hypertension			0.071
No	38.9	33.5	
Yes	61.1	66.5	
Diabetes			0.212
No	80.3	77.0	
Yes	19.7	23.0	
Asthma/bronchitis/ emphysema			0.004
No	90.1	83.7	
Yes	9.9	16.3	
Cardiac problems			0.040
No	80.1	74.0	
Yes	19.9	26.0	
Embolism/stroke/attack/ ischemia/cerebral thrombosis			0.604
No	93.1	92.1	
Yes	6.9	7.9	
Arthritis/rheumatism/artrose			< 0.001
No	71.1	56.9	
Yes	28.9	43.1	
Osteoporosis			< 0.001
No	82.1	67.9	
Yes	17.9	32.1	
Urinary Incontinence			< 0.001
No	84.6	65.9	
Yes	15.4	34.1	
Fecal Incontinence			< 0.001
No	96.5	90.5	
Yes	3.5	9.5	
Problems with nerves /psychiatric problems (N = 1,266)			< 0.001
No	90.0	80.5	
Yes	10.0	19.5	
Cataracts			0.833
No	26.4	27.1	
Yes	73.5	72.9	

Two Brazilian studies indicate that pain is the most frequent reason for using health care services.[17,22] No Brazilian studies were found which had analyzed whether older individuals suffering from pain made more use of health care services than those not suffering from pain.

Musculoskeletal pain,[5,7,15,19] pain in general,[16,17,19,22] incapacitating pain[12] and insomnia-related pain are among the characteristics of pain related to increased use of health care services.[1]

Suffering intense pain increases the likelihood of using health care services by 55.0%, as does pain which interferes moderately in work (52.0%) (Table 4).

Mild and moderate pain which does not interfere with day-to-day activities may be born and controlled without the need to use the health care services. Intense and very intense pain, and that which impacts negatively on activities at work and in the home are reasons for seeking help, aiming to reduce the suffering. They need to be controlled to decrease the impact on life. Thus, judgments and prejudices, resulting from the conception that pain may be caused by lack of care on the part of the sufferer or used to obtain personal advantages, are avoided.

Use of health care services increases among those suffering from incapacitating chronic [2,3,15,21] and intense pain,[3,12,21,24] as seen in this study.

Another significant result was the greater duration of the pain being a protection factor against use of health care service use, compared with pain lasting for a shorter time (Table 4).

At first, when suffering from pain, health care service use may be motivated by the expectation of obtaining a diagnosis and treatment which would control the suffering. In cases where this expectation is not met and the pain continues, individuals appear to opt for active analgesic strategies and not depend on health care professionals.

Weiner et al (2004) analyzed the relationship between the duration of pain in the lumbar region and health care service use, and verified results similar to those found in this study, in which pain lasting for shorter periods of time increases use of health care services.[24]

A differing result was found among older individuals with incapacitating pain in the lumbar region, in whom pain lasting for more than four months led them to use health care services more often than those who suffered from pain for up to three months.[15] This difference may be due to the fact that Reid et al[15] (2005) studied incapacitating lumbar pain. In contrast, Weiner et al[24] (2004) studied lumbar pain in general, which may have included pain that interfered less in the older individual's life.

Table 3. Prevalence of health care service use by older adults with chronic pain, according to variable of functionality and interference in work by pain. Sao Paulo, SP, Southeastern Brazil, 2006.

Variable	Prevalence	PR	95%CI	p
Dependency in BADL				0.893
Independent	43.7	1		
Dependent	44.5	1.02	0.76;1.36	
Dependency in IADL				0.769
Independent	42.9	1		
Dependent	44.6	1.04	0.81;1.33	
Mobility affected				0.579
No	41.0	1		
Yes	45.1	1.10	0.78;1.55	
Pain interference in normal work				0.047
None	37.5	1		
A little	47.5	1.27	0.90;1.78	
Moderate	57.0	1.52	1.11;2.09	
Quite a lot/extreme	38.7	1.03	0.68;1.56	

BADL: basic activities of daily living; IADL: instrumental activities of daily living

Pain is considered, by the elderly and health care professionals alike, to be a normal part of the ageing process. This idea leads to inadequate assessment and control of pain which imposes suffering on the older population.[4,8,25] Studies reinforce the hypothesis that decreasing use of consultations by older individuals suffering from pain for more than two years could be related to treatment having little effect.[4,25]

Among 152 older adults seen in public health care in Sweden, the agreement between their self-evaluation and that of the health care professionals was verified. The concordance for pain was poor (Kw = 0.21) (Karlsson et al,[8] 2010), meaning that very often pain is not properly assessed and is under-identified by health care professionals.

Chodosh et al (2005) analyzed randomized case-control studies in a meta-analysis of the effect of programs of control on chronic disease in older adults. The comparison showed a difference of -0.06 (95%CI -0.10;-0.02), between the intervention and control groups, representing 2 mm in the 100 mm of the analogical visual scale.[4] This meta-analysis concerned the poor effectiveness of programs related to controlling pain from osteoarthritis.

A bibliographical review analyzed 27 studies on the results of programs for older individuals suffering from musculoskeletal pain and found more favorable results: the results were positive in 96.0% of the studies. The proportion by which the pain changed was between 18.0% and 85.0%, with a mean 23.0% improvement. The degree of incapacity provoked by pain ranged from a 2.0% increase to a 70.0% decrease, with a mean 19.0% reduction. The study analyzed programs controlling pain from osteoarthritis, therapies such as yoga, massage and *Tai chi*, with different designs.[14] The methodological differences between the two studies may have influenced the differences in their results.

Another hypothesis which may explain decreasing use of health care services on the part of older individuals suffering from long-term pain, concerns differences in the assessment and perception of pain in this age group. Ageing provokes a decrease in the sensory threshold,

Table 4. Estimates of the prevalence ratios[a] of health care service use by older adults suffering from chronic pain. Sao Paulo, SP, Southeastern Brazil, 2006

Variable	PR_{br}	PR_{aj}	95%CI	p
Duration of pain (years)				0.002
1 to 2	1			
More than two	0.67	0.67	0.52;0.86	
Intensity				0.003
Mild/medium/moderate	1			
Strong/intense/very strong /very intense	1.47	1.55	1.16;2.06	
Pain interference in normal work				
None	1			
A little	1.27	1.26	0.91;1.76	0.167
Moderate	1.52	1.45	1.08;1.96	0.015
Quite a lot/extreme	1.03	0.92	0.62;1.36	0.674

PR_r: raw prevalence ratio; PR_{aj}: adjusted prevalence ration
[a] using Cox's multiple regression model

which may explain changes in the manifestation of pain, alterations which are well-known in acute injuries. Degeneration of the structure of the peripheral and central nervous system can alter the processing and the perception of painful stimuli. However, it is unclear whether or not this degenerative ageing process affects the perception of chronic pain.

There are many reasons why individuals use health care services and these involve factors related to the individual and to the organization of the services. Factors concerning the client include social and cultural aspects and health conditions' those related to the health care system include availability of services, conditions of access, quality of health care and the population's link to the services.

The randomized sampling technique, based on census tracts ensured that the sample was representative of the older population living in the urban area of Sao Paulo. The completeness and the quality of the data collected in the SABE study[20] provided diverse information which enabled the variables to be controlled, strengthening the associations found. The methodological strategy of controlling for the influence of other comorbidities meant that the real influence of pain on health care service use could be shown.

The data used came from a survey on overall health, with no specific focus on pain, which could be considered a limitation of this study. Thus, service use was broadly investigated, without a direct search into the relationship with the presence of pain.

The data were based on self-reporting of the diseases and phenomena analyzed. Memory tends to be effective for outstanding events such as hospitalization, but may be less precise with regards consultations. There is a tendency to underestimate the frequency of health care service use when the data depends solely on the memory. Self-reported diseases are based on the reports of older individuals and were not confirmed with health care service documentation. However, the SABE study carried out a careful assessment of the cognitive state of the older individual and, in cases of cognitive deficiency, a supporting or substitute interviewee was used, to ensure greater reliability in the data collected.

It is possible to show association between the phenomena in question using cross sectional analysis, although no causality should be inferred.

Recognition of pain as a health problem to be assessed, diagnosed and treated and not to interpret it solely as a symptom of another disease means that measures for its control can be proposed, which could improve the living and health conditions of a considerable number of older individuals.

In conclusion, the results show that pain interferes in different aspects of the life of older individuals, as well as burdening the health care service.

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