Original Research Article

Cross sectional study on low back ache and its physical determinants in Rayalaseema area – Andhra Pradesh

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Abstract

Background: Low back pain is a symptom with different etiology and many definitions. To evaluate acute low back pain, as recorded in various settings it is understood that more often it is injury related or is due to minor change in body position, doing or lifting things while sitting in a bad posture and doing repetitive activities. This may cause damage to interspinous ligaments and spraining of intervertebral joints. **Methodology:** The present study is cross sectional study conducted with the objective to find the physical determinants causing low back pain in Rayalaseema region, among rural population where majority of them are into strenuous daily activities. **Results:** The study participants who are overweight experienced back pain three times more as compared to those who are in normal weight with p value 0.012, OR 3.87 with 95% CI 1.2 -11.7.The participants of the study who do repetitive works experienced thrice as much pain experienced by those who do non-repetitive works with OR 3.12, 95%CI 1.02-9.48 and significant p value being 0.038(p value<0.05 significant). **Conclusions:** People who are in age group of 30-60 years of which who are engaged in repetitive works experience more low back pain. Hence the community is to be made aware of ways to reduce strain or effect of weight on the back through health education campaigns and encourage physical exercise.

Key Words: Low back ache, repetitive work, over weight.

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INTRODUCTION

Low back pain is a symptom, which is more often subjective, also a symptom which is not validated by an external standard[1]. It is a common problem but with different etiology and many definitions. Several studies were done to assess the risks of low back ache related to occupational activities. Results were inconsistent for factors such as physically hard work[2]. Low back pain is also defined as pain between ribs and top of the leg, with varied causes[3]. Musculoskeletal structures when they undergo contraction produce pain in other musculoskeletal structures innervated by the same spinal segment[4]. Musculoskeletal structures, those innervated by dorsal and ventral rami of spinal nerves respond to pain stimuli in the low back region. Ventral rami of spinal nerve complex are constituted by spinal nerve roots, sinu vertebral nerves and grey rami (communicate with sympathetic nerves). Dorsal rami of spinal nerve complex are amalgam of medial branches and lateral branches which distribute medial to spine and outside respectively[5]. Epidural connective tissue, dura matter, posterior longitudinal ligaments, and discs are innervated by sinuvertebral nerves, and anterior longitudinal ligaments and uncovertebral joints are innervated by grey rami. Among dorsal rami, medial branches innervate facet joints, multifidus muscle, and rotator muscle, and lateral branches innervate thoracolumbar fascia, intertransverse muscles, lumbar quadrate muscles, erectors, and skin of

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the low back region. According to the literature on pathophysiology of nerve innervation in the low back region, non-specific low back pain derives its explanation from region innervated by these nerves. Therefore, to classify systematically is been a challenge[5,6].

MATERIAL AND METHODS

The particular study is conducted in rural area of Rayalaseema region, Andhra Pradesh. Rayalaseema region geographically is comprised of four southern districts; Anantapur, Kurnool, Chittoor and Kadapa. This region is rich in minerals like asbestos, dolomite, china clay, barytes, lime stone, iron ore etc. The Rayalaseema area is more prone to drought. Majority of the rural population of this region are into strenuous mechanical work as daily wage labourers either into agriculture or at construction sites. The present study is conducted in one such rural area of Anantapur district of Rayalaseema region. This is a cross sectional study done on 100 subjects over a period of six months. The subjects are randomly selected and involved in the study after the consent. Individuals of more than 16 years of age, and those who gave consent to participate in the study are included. Elderly, bed ridden and pregnant women are not included in the study. In this study the individuals who are available in the village are chosen to understand how variant the population is and to understand the reasons better from the general population and not just a professional sector. A validated semi structured questionnaire, which is pilot tested is administered. The data is entered using MS EXCEL 2007 and analyzed using inferential statistics, with P value < 0.05 being significant. Visual analogue scale (VAS) is administered to understand the severity of back pain in the study individuals which is validated[7]. In this study Faces Rating Scale or Wong Baker Face scale, which is a type of VAS is used.

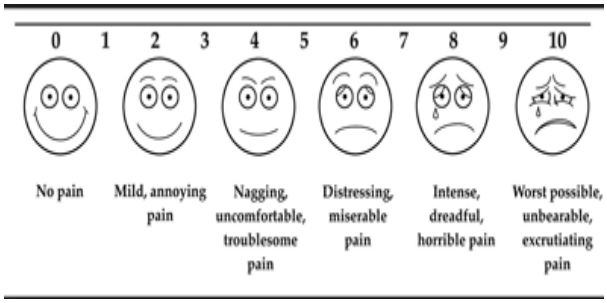

Figure 1:

RESULTS

The study is done on 100 participants who are residents of the rural area of Anantapur district. Of the 100 participant`s majority of them are women attributing to 65% and men of 35%. Among the study population 29% belong to age group of above 60 years, 29% to age group of 31-45 years and 31% in the age group of 46-60 years. Of the 100 participants, 88% of them belong to middle class according to modified Kuppusamy classification (2014).

Table 1: Socio demographic feature of study population

Socio demographic feature of study population			
Characteristics	**Categories**	**Frequency**	**Percentage**
Age	15-30	11	11%
	31-45	29	29%
	46-60	31	31%
	>=61	29	29%
Sex	Male	35	35%
	Female	65	65%
Socioeconomic Status	Lower	12	12%
	Middle	88	88%
Marital Status	Unmarried	11	11%
	Married	89	89%
Parity	Primi	10	15%
	Multi	55	85%

Among those participated 89% of them are married. Among the women participated 55% of them are multiparous. The study is done in rural area where 48% of the population who participated are manual labourers; with varied occupations which included weavers, masons, construction site labourers etc. Next to this 23% of them are house wives who do their daily chores including cooking, washing clothes, mopping the floor and other house hold activities.

Table 2: Occupation of the study population

Characteristics	Categories	Frequency	Percentage
Occupation	House wife doing daily chores	23	23%
	Manual labourer	48	48%
	Petty shop	2	2%
	Mason	2	2%
	Cook	3	3%
	Teacher	2	2%
	ASHA(accredited social health activist)	1	1%
	Driver	4	4%
	No work	15	15%

Of the study participants 82% of them complained of pain on and off for more than a year. Among those interviewed, only 2 of them suffered back pain due to injury to the back with accidental fall and fall from the roof (from a height). Only 5 of the subjects in the study gave a history of co-morbidities namely diabetes (1%), hypertension (3%) and hypothyroidism (1%). Of the study participants 12% answered “yes” to pain affecting daily routine, though 82% of them gave past history of pain. The study participants through the interview

revealed that 50% of them have chosen private clinic(a private practitioner), 18% of them have visited PHC`s/ GH, 12 % of them opted to use medicines that are available at home and 11% used medicines out of the counter. Though the study area is a rural backward region in Rayalaseema only 3% of them resorted for traditional healing.

Table 3: Health seeking behavior

		Frequency	Percentage
Places visited for treatment	Medicines available at home	12	13%
	Traditional medicine	3	3%
	Pharmacist	11	12%
	PHC/Govt Hosp	18	18%
	Private clinic	50	53%
	No response	6	7%
Pain affecting daily routine	Yes	12	12%
	No	75	75%
Other co-morbidities	Hypertension	3	5%
	Diabetes mellitus	1	
	Hypothyroidism`	1	
History of past injury	Yes	2	2%
	No	98	98%

On applying visual analogue scale to understand the severity of pain two of the study participants expressed the pain they are suffering as distressing/miserable pain. Participants who experienced nagging, uncomfortable or troublesome pain are 39 in number, 48 of them felt their pain is mild and annoying where as 11 participants expressed that they don't have disturbing pain. None of the participants had intense or worst experience of pain.

Table 4: Pain scoring on visual analogue scale

Characteristics	Category	Frequency	Percentage
Pain scoring on VAS (Visual Analogue Scale)	No pain(0,1)	11	11%
	Mild annoying pain(2,3)	48	49%
	Nagging, uncomfortable, troublesome pain(4,5)	39	37%
	Distressing, miserable pain(6,7)	2	1%
	Intense, dreadful, horrible pain(8,9)	0	0%
	Worst possible, unbearable pain(10)	0	0%

Table 5: General characteristics of the study participants:

Height (cm)	Female	Frequency	Percentage
	<=153cm	42	65%
	>153	23	35%
	Male		
	<=166cm	22	63%
	>166cm	13	37%
Weight (kg)	Female		
	<55kg	30	46%
	>55kg	35	54%
	Male		
	<60kg	18	51%
	>60kg	17	49%
	Female		
	<25	16	24%
BMI (Body Mass Index)	>=25	49	76%
	Male		
	<25	32	91%
	>=25	3	9%

The general characteristics of the study population is studied, and it is observed that 35% of the women are of height more than 153 cm, with 153cm as the median cut off height among the female study participants. Among men the median cut off observed is 166cm and 37% of them are more than 166cm height. To understand the characteristics in detail weight is also analyzed according to the gender differences, with median cut off for men as 60 kg and women is 55kg respectively. Of the study participants 46% of women are of more than 55kg and 49% of men are more than 60kg.Among the participants 76% of women are overweight with BMI(body mass index) ≥25 as compared to men who are only 9%.

Table 6: Associations between of socio demographic characteristics vs. low back pain

Variable	Total	Low back pain		
		Yes	NO	
Age(Y)				X^2 =4.28 P=0.03* OR 2.63 95% CI 1.03-6.70
30-60	71	56	15	
>60	29	17	12	
Sex		Yes	No	X^2 =1.35 P=0.244
Male	65	53	12	
Female	35	25	10	

In the present study all the subjects who are in the age group 30-60 years reported to have experienced low back pain twice as much as compared to elderly population who are more than 60 years of age with (odds ratio) OR 2.63, at 95% CI 1.03-6.70 (95% confidence interval) and p value 0.03(p<0.05 is significant), while there is no significant difference observed between male and female population with respect to low back pain.

Table 7: Association of low back pain and BMI

BMI	Total	Low back pain		X^2 6.2 P value 0.012*
		Yes	No	
18.5- 24.99	48	34	14	
>25	52	47	5	
OR 3.87, 95% CI 1.2-11.7				

In the present study, the participants showed that those who are overweight experienced back pain three times more as compared to those who are in normal weight with p value 0.012, OR 3.87 with 95% CI 12 -11.7.

Table 8: Association between occupation and low back pain

Occupation	Total	Back pain		X^2 = 4.27 P value= 0.038*
		Yes	No	
Repetitive	58	51	7	
Non-repetitive	30	21	9	
95% CI 1.02-9.48 OR 3.12				

The participants of the study who are manual labourers, farmers, weavers, masons, carpenters, construction site workers and house wives who does daily chores are all grouped as those who does repetitive works. Those who do repetitive works experienced thrice as much pain experienced by those who do non-repetitive works with OR 3.12, 95% CI 1.02-9.48 and significant p value being 0.038 (<0.05).

Table 9: Association between average weight of women and low back pain

Average weight of the women	Total	Back pain		X^2 5.37 P value 0.02*
		Yes	No	
>55KG	30	27	3	
≤55KG	35	23	12	
OR 4.69, 95% CI 1.17-18.7				

The mean average weight of the women of the study population is 55kg, with the mean average weight as the cut off, the strength of association between the weight of the women and back pain are calculated.

Table 10: Past history of pain for more than 1year vs back pain

past history of pain more than 1 year	Total	Back pain		X^2 14.40 P value 0.000148*
		Yes	No	
pain more than 1 year	82	70	12	
pain less than 1 year	18	8	10	
OR 7.29, 95% CI 2.3-22.1				

Individuals who had past history of low back pain for more than one year, evidently proved to be suffering from low back pain even after 1 year with an odds ratio of 7.29 at 95% CI 2.3 - 22.1 with significant p value of 0.000148, and continues to progress into chronic pain.

DISCUSSION

The present study is conducted in rural area of Rayalaseema region, with an objective to know and understand the physical determinants of low back pain in this group of population. The present study is done on 100 participants of which 65% of them are female and 71% of them belong to age group of 30-60years and 29% of the population is of age more than 60 years of which 17% of them are suffering from low back pain. In the systematic review done by Bressler and colleagues, reported that low back pain experienced by elderly in the community range from 13% to 49 %[8]. Several studies reported high incidence of low back pain in women[9-12] where as in the present study no significant gender preponderance is observed. There is no significant association observed with socio economic status with low back pain though 98% of the study population belong to low socioeconomic status according to modified Kuppusamy classification 2016[11]. Majority of the study participants are manual labourers (48%) and house wives who do their daily chores (23%). This accounts to the form of work they do including repetitive activities like bending, sitting, standing, stretching etc against a restrictive force which will have an impact on muscle contraction and involves various muscle groups in the

musculoskeletal structure. Those who do repetitive works experienced back pain more as compared to those who did non repetitive works. Chaffin and Park reported eight times higher incidence in low back pain in workers involved in heavy manual lifting compared to sedentary work[12]. Several studies show that prevalence of occupational factors are strongly related as compared to gender[13]. Back pain is more often reported during or takes its onset through and during pregnancy [14,15] but in the present study the pregnant women are not included. Various studies have shown relation to low back pain to height[16,17] but in the present study no such significant correlation is found. Also there many other studies where there is no significant relation found[18]. The mean average weight of the women of the study population is 55kg, with the mean average weight as the cut off, the strength of association between the weight of the women and back pain are calculated. Of the women who weighed more than 55kg, the study shows that the risk of having back pain is four times more with OR 4.69, 95% CI 1.17-18.7.There are several hypothesis on association between low back pain and obesity, of which since the excess fat distribution makes an individual limit the physical activity like sitting, standing and walk and also result in excessive wear and tear[18-20] A woman with multiple child births were reported to have association with low back pain[21], but in the present study no such difference is noted. Von korff and co-workers reported the presence of recurrent or chronic low back pain at the end of one year in their research[22]. Several prospective and retrospective studies have revealed increased risk of recurrent episodes of low back pain among those with the history of back pain[23-25].

CONCLUSION

The present study shows that the study participants who are of the age group of 30-60 years have experienced low back pain more as compared to elderly population. Low back pain is more prevalent among people who are engaged in occupations of repetitive nature like manual labourers, workers who lift heavy weights, house wife who do mopping, cleaning activities and other daily chores. To reduce the risk of low back pain among this age group which is also the productive age group, they are to be advised to take cautious efforts while lifting weights. The recommendation is to advise them to bring the weight as near to the body weight as possible to prevent strain on back and then lift. This is probably to be taught through health education campaigns. Participants who experienced low back pain has significant association with overweight so the community is to made aware of the adverse effects of overweight and obesity and physical fitness is to be advised. Those with previous history of low back pain are advised to consult doctor and try to resolve the issue rather than resorting to home based treatment or resorting to over the counter medication. In the present study the physical determinants are found to be age, type of work, overweight and duration of pain.

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