Student IJMR

Current analgesic use predicts low emotional quality of life in youth: A cross-sectional survey among university students in Sikkim, North East India

Shurmala Ahongshangbam & Amit Chakrabarti[*]

Department of Pharmacology, Sikkim Manipal Institute of Medical Sciences, Gangtok, India

Background & objectives: Occurrence of chronic physical pain is increasingly identified among youth, and medically unsupervised analgesic use is a possible risk factor for opioid dependence and other mental diseases in later life. Therefore, the present study was carried out in young student population in Sikkim, India, to explore predictors (including current chronic pain and current analgesic use) of low QoL in youth to identify a subset of population vulnerable to substance use and mental diseases in later life.

Methods: The study was conducted in a health university setting in Sikkim, North East India. In this cross-sectional study, 156 participants were enrolled with almost equal number of males and females. Generic instruments for demographics and current analgesic use and SF - 36, for assessment of quality of life (QoL), were used. QoL was measured in general, physical and emotional domains. Presence of chronic physical pain during past four weeks was captured using SF - 36.

Results: Almost two-third participants reported presence of current physical pain (69%, n=108); and (14%, n=22) reported current analgesic use for pain. In logistic regression model controlled for age, ethnicity, gender and residence, higher body mass index (BMI) (β=-0.16, *P*=0.02) and current analgesic use (β=1.6, *P*=0.006) predicted low QoL in emotional domain (less accomplishment due to emotional problem). Current analgesic use also predicted low QoL in another measure of emotional domain (depressed β=2.0, *P*=0.001).

Interpretation & conclusions: This study identified a subset of participants in their youth with low QoL in emotional domain predicted by current analgesic use and possible overweight problem. Low QoL in more than one emotional domain also identifies possibility of later psychiatric impairment. However, chronic pain did not emerge as a significant predictor of low QoL in emotional domain.

Key words Analgesic - pain - predictor - quality of life - Sikkim

[*]*Present address*: Regional Occupational Health Centre (ROHC), Eastern, National Institute of Occupational Health (NIOH), Indian Council of Medical Research (ICMR), Block-DP-1, Sector V, Salt Lake, Kolkata 700 091, India

Chronic physical pain, so far recognized as a health problem of the middle-aged and the elderly, is now identified as a health problem among adolescents and youth. Studies have reported chronic back pain among participants in the age group of 10 to 19 yr of age[1] and chronic idiopathic pain among adolescents not related to known disease or injury[2]. Chronic pain in youth also results in medically unsupervised use of analgesics for relief of pain[3]. Moreover, chronic pain among adolescents and youth also affects mental health. Evidence shows presence of chronic pain may predispose to alcohol and other illicit drug use in youth[3]; and co-morbid depression is a risk factor of suicide ideation and attempt among adolescents[4]. Further, both chronic pain and medically unsupervised use of analgesics are understood as possible risk factors of opioid dependence[5,6]. Research also suggests that low quality of life (QoL) scores at baseline retain a predictive value for development of disease like asthma even after an interval of 12 years[7].

The present study was carried out in a sample of university students in their youth in a health university in Sikkim, the second smallest State in India. This State is located in the foothills of the Himalayas and shares international borders with Nepal, Bhutan and Tibet. Sikkim is inhabited by indigenous population of Lepchas, Bhutias and Nepalis and has a population of 607,688[8]. The objective of this study was to identify baseline participant characteristics including presence of current chronic pain and current analgesic use for chronic pain as predictors of low QoL with an aim to identify a subset of population likely to be more vulnerable to substance use or other mental diseases in later life.

Material & Methods

This exploratory survey was conducted among students pursuing health sciences courses at a health university (Sikkim Manipal Institute of Medical Sciences) in Gangtok, Sikkim, India. Selection of participants, administration of informed consent procedure and participant interviews were done during the months of June and July, 2010.

The study design was cross-sectional. The data was collected from face-to-face interviews. Source document was a validated case record form by investigator containing the following: *(i)* A generic demographics and analgesic use section [*e.g.* age, body mass index (BMI), gender, ethnicity, measures of analgesic use, *etc.*], and *(ii)* SF - 36, quality of life

questionnaire, an 11-item standardized instrument for assessment of quality of life in physical and psychological domains[9].

Sampling procedure and size: Other studies among African and European adolescents have detected a point prevalence of chronic pain in the range of 17 to 44 per cent[1,2]. We assumed a lower prevalence of chronic pain in the range of 5 to 10 per cent in our study population. Although this was not a prevalence study, to perform a predictor analysis of low QoL, the study was aimed to enroll at least 112 subjects to capture at least 5 to 10 per cent participants with chronic pain and analgesic use, at a confidence interval of 95%. The sampling was restricted to students currently pursuing a course of study in the institute. Required sample size was uniformly distributed among all currently studying students from all disciplines. Students willing to participate in the study were randomly enrolled by toss of a coin (heads - enrolled/tails - not enrolled) to fulfill the enrollment target from that particular year and discipline. A balance of enrollment was maintained between gender, ethnicity and residence (staying in hostel/staying with family). Finally, a total of 156 participants were enrolled and completed the study.

Data collection and management: Before interview the participants were explained about the nature and objectives of the study and nature of questions involved. All responses were recorded on the questionnaire form. Participants were not offered any monetary or other compensation in lieu of participation in the study. Data were de-identified, coded, entered and encrypted in secure files.

The study consisted of only interviews and subsequent data analysis from questionnaires and did not involve any medical, behavioural, therapeutic or instrumental intervention. The study protocol was approved by the Institutional Ethics Committee (IEC) of Sikkim Manipal Institute of Medical Sciences, Gangtok, India.

Measures: Analgesic use was expressed as current use (during past 30 days) of any analgesic for chronic pain purchased through a prescription or over the counter (OTC) during the past month defined by number of doses/day and number of days/month. BMI was calculated as weight in kilograms/height in meters[2] and was expressed as kilogram/meter[2]. SF - 36 measures were collated for ease of statistical coding and analysis without losing their implication, *e.g.* measures of "some of the time", "most of the time" and "all of the

time" were collated as "some to most of the time"; "limited a little" and "not limited at all" were collated as "not limited", *etc.* and coding was done accordingly. History of pain was elicited from SF-36 enquiring about bodily pain experienced during past four weeks. Participants were advised not to mention common pain, *e.g.* occasional head ache, tooth ache and pre-menstrual pain. Only a history of current chronic physical pain (*e.g.* back pain, musculoskeletal pain, idiopathic pain, *etc.*) was graded by self report and recorded. Pain was coded as "none", "mild", "moderate" or "severe".

Statistical analysis: Socio-demographic variables measured in participants were both continuous (*e.g.* age, BMI) and categorical (*e.g.* ethnicity, gender); and were expressed as means ± SD and by frequency distribution, respectively. Any gender difference in continuous socio-demographic variables was analyzed using one-way analysis of variance (ANOVA). Measurements of analgesic use and current physical pain were expressed by frequency distribution. Measures of QoL in general, physical and emotional domains were ordinal and were expressed by frequency distribution and differences in QoL measures among current analgesic users and non-users were analyzed by chi-square test. Odds ratio (OR) with 95% confidence interval (CI) were used to express risk of poor QoL. Predictor analysis for poor QoL was carried out by logistic regression for dichotomous dependent variables of QoL and baseline participant characteristics, *viz.* BMI, pain and current analgesic use were entered as possible predictors. All analyses were controlled for age, gender, ethnicity and place of residence of participants. Key dichotomous measure of emotional QoL entered as dependent variable was "less accomplishment in daily work due to emotional problems during past four weeks" (yes/no). Data were analyzed using PASW 18.0 (Statistical Package for the Social Sciences, SPSS Inc., Chicago, USA).

Results

Of the total 156 participants, 81 (52%) were males and 75 (48%) females. Of all participants most (73%, n=114) were students from other regions of India, and of the remaining students who were of Sikkimese origin, 19 per cent (n=29) were Nepalis, 6 per cent (n=10) were Bhutias and 2 per cent (n=3) were Lepchas. Most students (77%, n=120) resided in hostels and 23 per cent (n=36) stayed with families and commuted to college. Sampling was balanced across gender, ethnicity and student residence status and approximately replicated the actual trends. The mean (expressed as mean ± SD)

age (range 18-27 yr) and body mass index (BMI) of all participants were 21±1.8 yr and 22±2.8 kg/m², respectively. There was a significant difference in age (*P*<0.01) and BMI (*P*<0.001) between male and female participants with females being just younger and with lower BMI.

Twenty two participants (14%) reported current analgesic use (any analgesic use during past 30 days for chronic pain purchased through a prescription or over the counter); most used one dose/day (67%, n=12) and less than seven doses/month (73%, n=16) and all used analgesics for pain relief. All analgesics were non-steroidal anti-inflammatory drugs (NSAIDs) like acetaminophen, ibuprofen, *etc.* and no opioid analgesic use was reported. In the pain measurement almost one third participants (31%, n=48) did not report any physical pain during past four weeks. However, almost two-thirds reported some physical pain with 51 per cent (n=79) reporting "mild" pain; 15 per cent (n=23) reporting "moderate" pain; and 4% (n=6) reporting "severe" pain.

QoL was measured in three broad domains, *viz.* general, physical and emotional (Table I). There was no significant difference among current analgesic users and non-users in key measures of general domain (current health) and physical domain (limitation of moderate activities). Key measures in emotional domain were "less accomplishment in daily work due to emotional problems during past four weeks", "nervous during past 4 wk" and "depressed during past 4 wk". There was significant difference among current analgesic users and non-users in measures of emotional QoL like "less accomplishment in daily work due to emotional problems during past four weeks" (*P*=0.01; OR=2.70, 95% CI=1.25 to 5.81) and "depressed during past four weeks" (*P*<0.001; OR=4.8, 95% CI=1.85 to 12.43). Gender difference existed only in a key general domain (current health) with females reporting significantly more "fair to poor" current health measure (*P*=0.015; OR=3.3, 95% CI=1.3 to 8.5).

In logistic regression model (Table II) baseline participant variables were entered to predict a key measure of emotional QoL. Higher BMI (β=-0.16, *P*=0.02) and current analgesic use (β=1.6, *P*=0.006) predicted low QoL in one key emotional domain (less accomplishment in daily work due to emotional problems during past 4 wk). On further exploratory analysis, current analgesic use further predicted low QoL in another measures of emotional domain; "depressed during past 4 wk" (β=2.0, *P*=0.001).

Table I. Comparison of quality of life (QoL) among participants using analgesics and not using analgesics- Findings from SF-36

Measures of QoL		Analgesic users (n=22) (%)	Analgesic non-users (n=134) (%)
Current health	Good to excellent	17 (77.3)	114 (85.1)
	Fair to poor	5 (22.7)	20 (14.9)
Moderate activities	Limited	5 (22.7)	21 (15.7)
	Not limited	17 (77.3)	113 (84.3)
Emotional* health –	Some to most of the time	12 (54.5)	36 (26.9)
Accomplish less	Little or none of the time	10 (45.5)	98 (73.1)
Emotional health – Nervous	Some to most of the time	11 (52.4)	47 (35.1)
	Little or none of the time	10 (47.6)	87 (64.9)
Emotional** health – Depressed	Some to most of the time	16 (76.2)	46 (34.3)
	Little or none of the time	5 (23.8)	88 (65.7)

*$P<0.01$, **$P<0.001$

Table II. Prediction model for quality of life (QoL) in emotional domain

Baseline predictors	Less accomplishment in daily work due to emotional problems during past four weeks	
	Beta (β)	P
Age	0.32	0.02
Gender	-0.56	0.18
Body mass index	-0.16	0.02
Ethnicity	0.24	0.63
Residence	-0.12	0.83
Current pain (past 4 wk)	-0.09	0.62
Current analgesic use (past 30 days)	1.60	0.006

Discussion

The present investigation explored predictors of low QoL in youth. Although the participants were young, almost two-thirds of the participants had some pain and almost 20 per cent reported "moderate" to "severe" pain. Therefore, this observation is in keeping with the emerging evidence of presence of chronic pain in a relatively younger population[1,2]. The study also detected current analgesic use in 14 per cent and all analgesic users were having pain. However, none of the participants used opioid analgesics. This observation may also be related to availability of a few numbers of opioid analgesics for pain relief in India.

This study measured QoL in three main domains; general, physical and emotional. Special emphasis was given to the emotional domain as low QoL in this domain predicted by chronic pain and current analgesic use may increase risk of substance use disorder and other mental disorders in later life. The study identified two important predictors of low emotional QoL; higher BMI and current analgesic use. Additionally female participants in this study exhibited low general QoL. Low QoL in females is generally associated with higher body weight[10] and premenstrual syndrome[11]. In this study, participating females had a significantly lower BMI compared to males, but on an average a higher BMI for females could not be excluded as the BMI of female participants were not compared to controls with normal BMI. In this study higher BMI has also been identified as a predictor of low QoL, which is also in keeping with evidence from other settings[12]. Further, pain from premenstrual syndrome was not reported in pain measurement, but the emotional content of premenstrual syndrome may contribute to a low QoL for females.

A key observation in this study is emergence of current analgesic use as a consistent predictor of low QoL in emotional domain. Interestingly, analgesic use predicted low QoL in emotional domains like less accomplishment due to emotional problem and feeling depressed during the past four weeks. However, chronic pain did not emerge as a significant predictor of low QoL in emotional domain. There could be an interaction between chronic pain and analgesic use resulting in low QoL, but this interaction, if any, could not be detected in this study. In conclusion, this study could identify a subset of participants in their youth with current analgesic use and possible overweight and chronic pain predicting low QoL in emotional domain. Low QoL in more than one emotional domain predicted by analgesic use also identifies possibility of later psychiatric impairment.

The study was limited by an inadequate sample size, particularly in exploring the role of chronic pain as a predictor of low QoL. Further, the study did not

identify the exact nature and duration of pain. In spite of these the limitations the present investigation provides evidence that current analgesic use predicts low QoL, particularly in the emotional domain.

Acknowledgment

References

1. Ayanniyi O, Mbada CE, Muolokwu CA. Prevalence and profile of back pain in nigerian adolescents. *Med Princ Pract: Int J Kuwait University Health Sci Centre* 2011; *20* : 368-73.

2. Hoftun GB, Romundstad PR, Zwart JA, Rygg M. Chronic idiopathic pain in adolescence - high prevalence and disability: The young HUNT study 2008. *Pain* 2011; *152* : 2259-66.

3. Lord S, Downs G, Furtaw P, Chaudhuri A, Silverstein A, Gammaitoni A, *et al*. Nonmedical use of prescription opioids and stimulants among student pharmacists. *J Am Pharm Assoc* 2009; *49* : 519-28.

4. van Tilburg MA, Spence NJ, Whitehead WE, Bangdiwala S, Goldston DB. Chronic pain in adolescents is associated with suicidal thoughts and behaviors. *J Pain* 2011; *12* : 1032-9.

5. Ling W, Mooney L, Hillhouse M. Prescription opioid abuse, pain and addiction: clinical issues and implications. *Drug Alcohol Rev* 2011; *30* : 300-5.

6. Boscarino JA, Rukstalis M, Hoffman SN, Han JJ, Erlich PM, Gerhard GS, *et al*. Risk factors for drug dependence among out-patients on opioid therapy in a large US health-care system. *Addiction* 2010; *105* : 1776-82.

7. Leander M, Cronqvist A, Janson C, Uddenfeldt M, Rask-Andersen A. Health-related quality of life predicts onset of asthma in a longitudinal population study. *Respir Med* 2009; *103* : 194-200.

8. Office of the Registrar General and Census Commissioner. *Census of India 2011, Provisional population totals*. New Delhi, India: Registrar General and Census Commissioner; 2011. Available from: *http://www.censusindia.gov.in/2011-prov-results/RPT-2.html*.

9. Brazier JE, Harper R, Jones NM, O'Cathain A, Thomas KJ, Usherwood T, *et al*. Validating the SF-36 health survey questionnaire: new outcome measure for primary care. *BMJ* 1992; *305* : 160-4.

10. Garner RE, Feeny DH, Thompson A, Bernier J, McFarland BH, Huguet N, *et al*. Bodyweight, gender, and quality of life: a population-based longitudinal study. *Qual Life Res* 2012; *21* : 813-25.

11. Schiola A, Lowin J, Lindemann M, Patel R, Endicott J. The burden of moderate/severe premenstrual syndrome and premenstrual dysphoric disorder in a cohort of Latin American women. *Value Health* 2011; *14* (5 Suppl 1): S93-5.

12. Oliva-Moreno J, Gil-Lacruz A. Body weight and health-related quality of life in Catalonia, Spain. *Eur J Health Econ* 2013; *14* : 95-105.

Reprint requests: Dr Amit Chakrabarti, Scientist "E", Regional Occupational Health Centre (ROHC), Eastern, National Institute of Occupational Health (NIOH), Indian Council of Medical Research (ICMR), Block-DP-1, Sector V, Salt Lake, Kolkata 700 091, India
e-mail: amitchakrabarti@hotmail.com, amit.chakrabartis@gmail.com