

ARE SELF SNAGS EFFECTIVE FOR CHRONIC NECK PAIN?

SUNT AUTO AANS-URILE EFICIENTE ÎN DUREREA CERVICALĂ CRONICĂ?

Niyati Desai¹, Khatri SM², Keerthi Rao³

Key words: Sustained Natural Apophyseal Glides; Neck Disability Index; Nonspecific neck pain

Cuvinte cheie: Alunecări Apofiziale Naturale Susținute; Index de Dizabilitate a Gâtului; Durere Cervicală Nespecifică.

Abstract

Objective The purpose of the study was to investigate the effectiveness of self Sustained Natural Apophyseal Glides (SNAGs) on pain, active cervical Range of Motion and functional disability in chronic nonspecific neck pain.

Design Randomized Controlled Trial.

Setting Department of Musculoskeletal Physiotherapy, Pravara Rural Hospital (tertiary hospital), Loni, Tal- Rahata, Dist-Ahmednagar, Maharashtra State, India- 413 736.

Participants One hundred and three participants between 25-53 years of age with clinical diagnosis of chronic nonspecific neck pain.

Interventions Self SNAGs, therapist administered SNAGs and conventional physiotherapy for six weeks.

Main outcome measures The outcome measures used in the study were Numerical Pain Rating Scale (NPRS), Active Cervical Range of Motion (ACROM), and Neck Disability Index (NDI).

Results There was no significant difference in self administered SNAGS and therapist administered SNAGS in the treatment of chronic nonspecific neck pain over the period of six weeks.

Conclusions Patients with chronic nonspecific neck pain can be advised to perform Self Sustained Natural Apophyseal Glides (SNAGs) instead of therapist administered SNAGS.

Rezumat

Obiective Scopul acestui studiu a fost investigarea eficienței Alunecărilor Apofiziale Naturale auto Susținute (AANS) asupra durerii, a gamei de mișcări cervicale active și a dizabilității funcționale în cazul durerii cervicale cronice nespecifice.

Design Probă Controlată Aleatorie.

Locație Secția de Kinetoterapie Musculo-scheletală, Spitalul Rural Pravara (spital de gradul trei), Loni, Tal- Rahata, Dist-Ahmednagar, Statul Maharashtra, India- 413 736

Participanți O sută trei participanți cu vârstă cuprinse între 25-53 de ani, cu diagnostic clinic de durere cervicală cronică nespecifică.

Intervenții Auto AANS-uri, AANS-uri administrate de către terapeut și kinetoterapie convențională timp de șase săptămâni.

Principalele măsurători Principalele măsurători utilizate în studiu au fost Scala Numerică a Durerii (SND), Gama de Mișcări Cervicale Active (GMCA) și Indexul de Dizabilitate a Gâtului (IDG).

Rezultate Nu au fost diferențe semnificative între AANS auto administrate și cele administrate de către terapeut în tratamentul durerii cervicale cronice nespecifice timp de șase săptămâni.

Concluzii Pacienții cu durere cervicală cronică nespecifică pot fi sfătuiți să-și administreze singuri AANS.

¹ Postgraduate Student, College of Physiotherapy, Pravara Institute of Medical Sciences, Loni, Maharashtra State, India - 413 736. Phone: +91-2422-271489, +917507077127, Fax No: +91-2422-273413., Web: www.pravara.com E-mail: niyati.1432@gmail.com

² Professor & Principal, College of Physiotherapy, Pravara Institute of Medical Sciences, Loni, Maharashtra State, India - 413 736.

³ Associate Professor, College of Physiotherapy, Pravara Institute of Medical Sciences, Loni, Maharashtra State, India - 413 736.

Introduction

It has been stated that all the living species with spine curvatures will experience spinal pain in their lifetime. Hence, neck pain is anticipated to be one of the common musculoskeletal ailment after low back pain with a mean point prevalence of 7.6% (range 5.9–38.7%) and mean lifetime prevalence of 48.5% (range 14.2–71.0%) [1]. It is estimated that about 10 – 50% population with neck pain will develop chronic symptoms [2-4]. Jette et al reported that patients with neck pain treated in outpatient physical therapy department, frame approximately 25% of all patients [5]. The economic burden due to neck disorders is high, including treatment costs, absence from the work place, and loss of productivity [6, 12].

Cervical disorders are almost as prevalent as low back pain and like low back pain, in most of the cases it is difficult to determine the actual cause of neck pain hence will be regarded as ‘non-specific neck pain’ [13, 14]. If we see the present world economy, is at critical point. Data released in 2009 by the Government of India the estimated population who lived below poverty line was 37%. A study by the Oxford Poverty and Human Development Initiative found that there were around 108.7 million below the poverty line in Maharashtra in 2007. So the treatment cost may create an extra financial burden in absence of well established health insurance. Hence, there is need for a cost effective approach that can minimize financial burden of patients with chronic nonspecific neck pain. Various orthopedic manual therapy approaches including Mulligan’s approach have been considered for the management of chronic nonspecific neck pain.

Mulligan’s mobilization with movement viz. SNAGS (sustained natural apophyseal glides) for neck pain can be performed by therapist or patient can perform this on his/her neck. At present, there is limited literature available about the effectiveness of self SNAGS on chronic nonspecific neck pain and hence the present study was carried out to uncover this clinical paradigm.

Methods

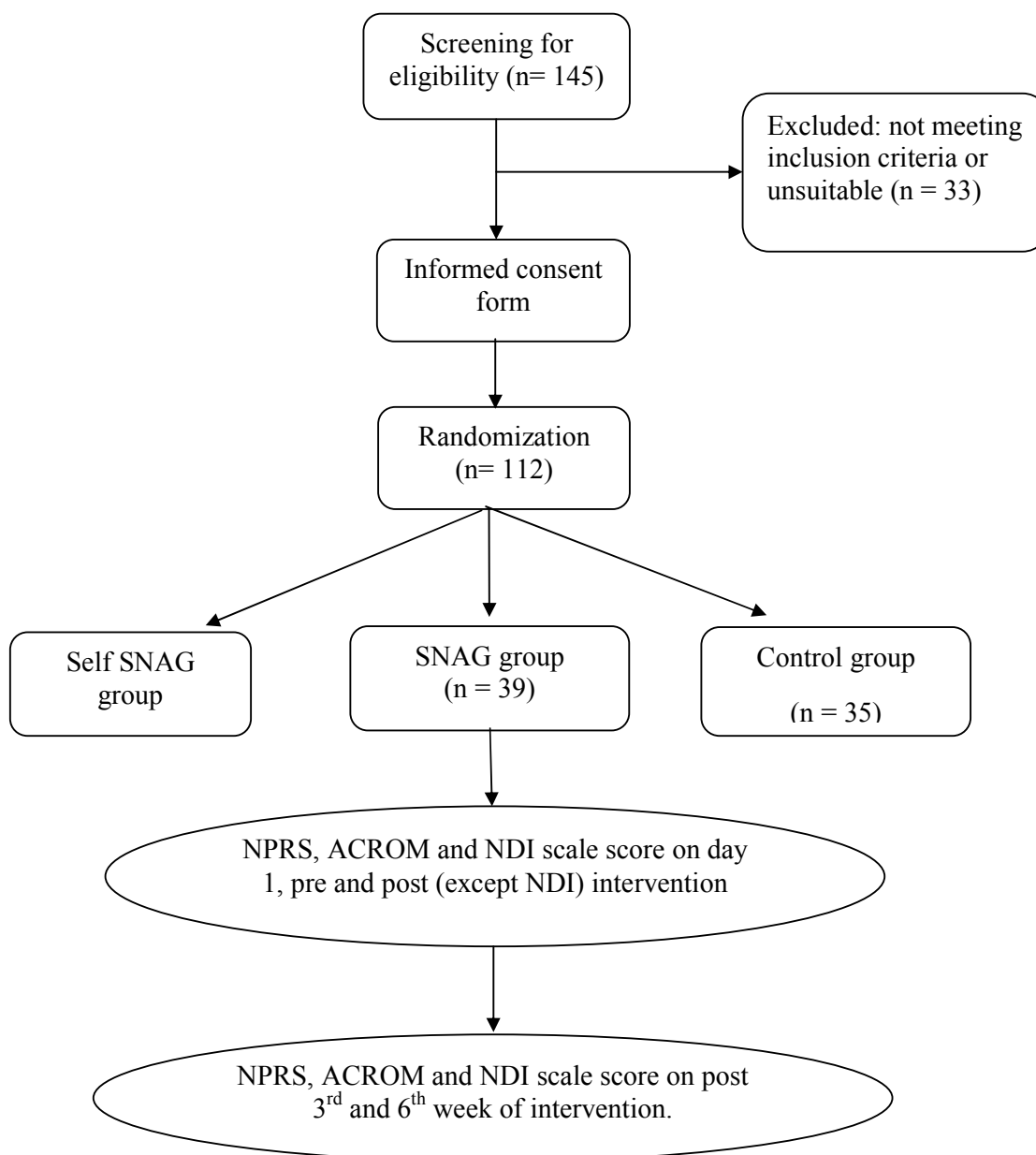
Subjects

A total of one hundred and forty five volunteers from the Orthopaedic Department, Pravara Rural Hospital (Tertiary Hospital), Loni, Tal- Rahata, Dist-Ahmednagar, Maharashtra State, India- 413 736 from Jan 2011 to Nov 2011 were screened for the study and one hundred and twelve volunteers with chronic neck pain between 25 to 53 years of age were included in the study. Prior to the participation, a written informed consent was taken from all the participants. A total of nine participants dropped out of the study since they had time constrain.

Participants were included if there was a diagnosis of chronic (>3months) neck pain and those who had responded to application of SNAGs. Participants were excluded if they had any of the following: 1)Pregnancy 2)Trauma or tumor around the neck 3)Rheumatoid arthritis 4)Ankylosing spondylosis 5)Vertebro basilar insufficiency syndrome 6)Motor and sensory disturbances 7)Patients with radicular symptoms and 8)Multiple symptoms of Myelopathy.

Outcome measures

The main outcome measures used in this study were Numerical Pain Rating Scale (NPRS) [15, 16] to measure the intensity of pain, Active Cervical Range of Motion (ACROM) [17, 18] as a mobility assessment tool, and Neck Disability Index (NDI) [17, 19-22] to check functional disability due to chronic nonspecific neck pain. All of these outcome measures used had considerably good reliability and validity.



Flow Diagram showing the procedure of participant allocation

Procedure

The study received approval from Ethical Committee of Pravara Institute of Medical Sciences, Loni. After the screening and as the written informed consent were obtained from all the participants, they were allocated in three groups by lottery method: Self SNAGs group (n= 38), SNAGs group (n= 39), and Control group (n= 35).

On the first day of treatment, participants in self SNAGs were taught how to perform self SNAGs with mulligan mobilization belt as per the guidelines mention by Mulligan [23]. In the following sessions the participants were performing self SNAGs



under the therapist's supervision to minimize the error and for the better results. Three sets of six to ten repetitions were instructed to perform in each session.

Conventional treatment given to all three groups was Interferential Therapy [24] followed by stretching of cervical and upper quadrant muscles which include scalenes, upper trapezius, levator scapulae, pectoralis minor and major and strengthening of cervical muscles [25].

Participants in SNAGs group were treated with institutional therapist administered SNAGs as per the guidelines mentioned in Mulligan Concepts [23]. Three sets of six to ten repetitions were given by the principal investigator. In addition to that conventional physiotherapy was given to the participants.

Participants in Control group were treated with only conventional physiotherapy same as self SNAGs and SNAGs group.

Results

Statistic analysis was carried out using the GraphPad InStat trial version. Confidence interval was set at 95%. Age, BMI, severity of neck pain, active cervical range of motion, and NDI at baseline for all three groups were analyzed with ANOVA.

A general linear model with a repeated measures factor of time (pre intervention and post intervention) and a between subjects (Self SNAGs, SNAGs and Control group) was used to determine the difference among the three groups in the intensity of pain, active ROM and related functional disability.

Baseline characteristics across three groups were similar and are summarized in table 1. No significant differences were detected between the three groups in terms of age, BMI, NPRS, ACROM, and NDI ($p > 0.05$).

Table1: Demographic and Clinical Data of the participants in Self SNAGs, SNAGs and Control group.

	Self SNAGs Group	SNAGs group	Control Group
Age	33.6±7.36	37.23±9.1	37.23±9.29
BMI	24.64±2.20	25.12±3.35	25.03±3.01
Male : Female	15:18	11:19	17:18
NDI score	37.09±7.53	36.37±8.10	36.4±7.05
NRS score	7.43±1.83	7.4±1.85	6.93±2.11
* Data are mean±SD (95% confidence intervals)			

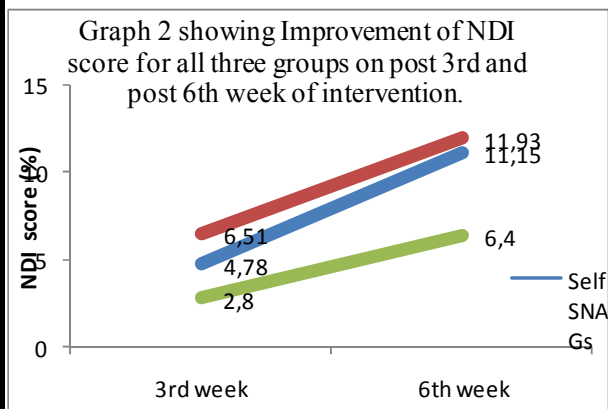
Hundred and twelve individuals with chronic neck pain had participated in the study and out of them nine participants did not complete the study. Two from the Self SNAGs group, four from the SNAGs group and three from the control group could not come to the follow up for the final evaluation because of the time constrain. No adverse effect was noted during the study period.

Significant differences in NPRS score (Graph 1) and active cervical range of motion was noted immediately after the first treatment and after three weeks of treatment. However, no significant difference was observed after six weeks of treatment (Table 2).

Neck disability index score was significant after three weeks of treatment but after six weeks of treatment no significant difference was observed in NDI (Graph 2). Thus, the result suggests uniform clinical benefits over the period of six weeks.

Table 2: Improvement in active cervical range of motion in Self SNAGs, SNAGs and Control group

ACROM	Self SNAGs Group			SANGs Group			Control Group		
	Mean ± SD			Mean ± SD			Mean ± SD		
	Immediate	3 rd week	6 th week	Immediate	3 rd week	6 th week	Immediate	3 rd week	6 th week
Flexion	4.96±1.75	12.46±4.38	17.36±5.67	7.26±2.9	15.3±4.60	20.7±4.19	1.8±1.54	4.16±1.36	7.43±2.28
Extension	2.93±1.43	8.6±2.90	13.37±3.76	6.2±2.49	13.93±4.54	18.3±5.59	2.33±1.76	5.96±2.834	8.83±2.76
Rt side flexion	3.00±1.87	7.6±2.66	10.56±3.57	4.13±2.40	8.97±3.41	12.03±5.47	2.83±1.23	6.03±2.10	8.8±2.20
Lt side flexion	2.86±1.63	7.83±2.85	10.46±4.49	4.57±2.41	8.6±3.80	11.8±4.94	2.46±1.43	5.93±1.78	8.96±2.52
Rt rotation	4.46±2.36	8.73±2.75	10.96±3.7	6.1±4.35	9.67±4.07	13.73±6.25	2.43±1.13	6.2±2.49	10.8±3.32
Lt rotation	3.73±1.72	8.7±2.76	13.73±4.05	4.53±1.59	9.33±3.22	16.86±4.64	2.76±1.43	6.46±2.73	11.7±2.43



Discussion

This study shows that therapist administered SNAGs and self SNAGs are equally effective over the period of six weeks in the treatment of chronic nonspecific neck pain although therapist administered SNAGs were found to be significantly better immediately after the first treatment and after three weeks of treatment.

Better results with therapist administered SNAGs could be due to accuracy of the technique and hands on therapeutic touch effect as compared to the self SNAGs or conventional physiotherapy wherein these two factors were lacking. This is in accordance with Toby Hall et al who reported similarly the effectiveness of C1-C2 self SNAGs in cervicogenic headache [26]. However, in present study self SNAGs were compared with therapist administered SNAGs and conventional physiotherapy unlike its comparison with placebo done by Toby et al and SNAGs were applied at lower cervical spine region mainly at C5-6 apophyseal joints and the outcome measures included NPRS, NDI and ACROM instead of headache index score.

Finally, the current study has various limitations which include small sample size, relatively short term intervention, limited follow up and the study had focused only on patients with chronic neck pain, and hence the findings are applicable to patients within this category only. Therefore, future studies with larger sample size, long term intervention period, and regular follow up is suggested. In addition to this, Effect of Self SNAGs on acute/subacute nonspecific neck pain may also be studied.

Conclusions Patients with chronic nonspecific neck pain can be advised to perform Self Sustained Natural Apophyseal Glides (SNAGs) instead of therapist administered SNAGS.

Acknowledgements

Ethical approval: Ethical Committee of Pravara Institute of Medical Sciences, Loni, Maharashtra state, India.

Funding: No funding was gained for the study.

Conflict of interest: None declared.

BIBLIOGRAPY

1. Fejer R, Kyvik KO, Hartvigsen J. (2006), *The prevalence of neck pain in the world population: A systematic critical review of the literature*. Eur Spine J;15(6):834-48.
2. Binder A. (2002), *Neck Pain*. Clin Evid;7:1046-62.
3. Carrol Lj, Hogg-Johnson S, Cote P, VAnd der Velde G, Holm LW, Carragee EJ, et al. (2008), *Course and prognostic factors for neck pain in the general population. Results of the bone and joint decade 2000-2010 taskforce on neck pain its associated disorders*. Spine;33:83-92.
4. Makela M, Heliovaara M, Sievers K, Impivaara O, Knekt P, Aromaa A. (1991), *Prevalence, determinants, and consequences of chronic neck pain in Finland*. Am J Epidemiol;134:1356-67.
5. Jett AM, Smith K, Haley SM, David KD. (1994), *Physical therapy episodes of care for patients low back pain*. Phys Ther;74(2):101-10.
6. Borghouts JA, Koes BW, Vondeling H, bouter LM. (1999), *Cost of illness of neck pain in the Netherland in 1996*. Pain;80:629-36.
7. Ezzo J, Haraldsson BG, Gross AR, Myers CD, Morien A, Goldsmith CH, et al. (2007), *Massage for mechanical neck disorders: a systemic review*. Spine;32(3):353-62.
8. Gross AR, Key T, Hondras M, Goldsmith C, Haines T, PelosomP, et al. (2002), *Manual therapy for mechanic neck disorders: a systemic review*. Man Ther;7(3):131-49.
9. Gross AR, Aker PD, Goldsmith, Peloso P. (2004), *Physical medicine modalities for mechanical disorders*. Cochrane Database Syst Rev Cochrane Library;2.
10. Hogg-Johnson S, Van der Velde G, Carroll LJ, Holm LW, JDI Cassidy, Guzman J, et al. (2008), *The burden and determinants of neck pain in the general population results of the bone and joint decade 2000-2010 taskforce on neck pain its associated disorders*. Spine;33(4S):39-51.
11. Vernon H, Humphreys BK. (2008), *Chronic mechanic neck pain in adults treated by manual therapy: a systemic review of change scores in randomized controlled trials of a single session*. J Manipul Physiol Ther;16(2): E42-52.
12. Viljanen M, Malmivaara A, Uitti J, Rinne M, Palmroos P, Laippala P. (2003), *Effectiveness of dynamic muscle training, relaxation, or ordinary activity for chronic neck pain: randomized controlled trial*. Br Med J;327(7413):475-9.
13. Chad E. Cook. *Orthopedic Manual Therapy –An Evidence Based Approach*.
14. Ruud Groeneweg, Hans Kropman, Huco Leopold, Luite van Assen, Jan Mulder, Maurits W van et al. (2010), *The effectiveness and cost-evaluation of manual therapy and physical therapy in patients with sub-acute and chronic non specific neck pain. Rationale and design of a Randomized Controlled Trial (RCT)*. BMC Musculoskeletal Disorders, 11:14:1-9
15. Cleland JA, Childs JD, Whitman JM. (2008), *Psychometric properties of the Neck Disability Index and Numeric Pain Rating Scale in patients with mechanical neck pain*. Arch Phys Med Rehabil;89:69-74.
16. Waice JA. (1997), *Validity of a verbally administered numeric rating scale*. Cancer nursing.;20:88-93.
17. Ioannis D. Gelalis, Louis E. DeFrata, Kosmas S. Stafilas, Emilios E. Pakos, James D. Kang and Lars G. Gilbertson. (2009), *Three dimensional analysis of cervical spine motion: reliability of a computer assisted magnetic tracking device compared to inclinometer*. Eur Spine J;18(2):276-81.

18. J.W. Youdas, J.R. Carey, T.R. Garrett. (1991), *Reliability of measurements of cervical spine range of motion - comparison of three methods*. Physical Therapy;71(2):98-106.
19. Pietrobon R, Coeytaux RR, Carey TS, Richardson WJ, DeVellis RF. (2002), *Standard scales for measurement of functional outcome for cervical pain or dysfunction: A systematic review*. Spine;27:515-22.
20. Vernon H, Mior S. (1991), *The Neck Disability Index: A study of reliability and validity*. J Manipulative Physiol Ther;14:409-15.
21. Cleland JA, Whitman JM, Fritz JM, Palmer JA. (2005), *Manual physical therapy, cervical traction, and strengthening exercises in patients with cervical radiculopathy: A case series*. J Orthop Sports Phys Ther;35:802-11.
22. Hains F, Waalen J, Mior S. (1998), *Psychometric properties of the neck disability index*. J Manipulative Physiol Ther;21:75-80.
23. Brain R mulligan. Mulligan concept. *Manual therapy: NAGS, SNAGS, MWMS* etc. Sixth edition. P10-18.
24. Defrin R, Ariel E, PeretzC. (2005), *Segmental noxious versus innocuous electrical stimulation for chronic pain relief and the effect of fading sensation during treatment*. Pain;115:152-160.
25. Petri K Salo, Arja H Häkkinen, Hannu Kautiainen, Jari J Ylinen. (2010), *Effect of neck strength training on health-related quality of life in females with chronic neck pain: A randomized controlled 1-year follow-up study*. Health and Quality of Life Outcomes;14(8):48.
26. Toby Hall, Ho Tak Chan, Lene Christensen, Britta Odenthal, Cherie Wells, Kim Robinson, (2007), *Efficacy of a C1-C2 Self-sustained Natural Apophyseal Glide (SNAG) in the Management of Cervicogenic Headache*. Journal of orthopaedic & sports physical therapy;37(3): 100-7.