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Back and neck pain in seniors—prevalence and impact

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Abstract Neck pain (NP) and back pain (BP) are common complaints in seniors yet specific information on these complaints is lacking in the scientific literature. We present cross-sectional interview data from the 2003 data collection within the population based Longitudinal Study of Aging Danish Twins dealing with the 1-month prevalence of NP and BP and the intensity of possible pain. Further, we present the 1-year prevalence of NP and BP, duration of pain, influence of NP and BP on daily activities and care seeking for NP and BP. 84.4% of invited twins aged 70–102 years participated in the study. The 1-month prevalence of NP and BP was similar to previously reported results. 7% of men and 13% of women reported moderate or severe NP and 12% of men and 19% of women reported moderate or severe BP on a monthly basis. 10% of men and 12% of women reported more than 30 days of NP within the past year and 13% of men and 21% of women reported more than 30 days of BP

within the past year. 5% of men and 8% of women had altered or diminished their physical activities due to NP and 9% of men and 16% of women had diminished their physical activities due to BP within the past year. 10% of men and 12% of women had had treatment for NP within the past year and 13% of men and 19% of women had had treatment for BP within the past year, most commonly from general medical practitioners and physical therapists. Altering or diminishing physical activities and care seeking were associated with both pain intensity and duration of pain. NP and BP of longer duration were associated with significantly lower physical performance scores when compared to no NP or BP during the past year. NP and BP in seniors are probably associated with difficulty but not inability to perform daily activities.

Keywords Back pain · Neck pain · Epidemiology · Geriatrics

Introduction

Back pain (BP) and neck pain (NP) are among the most common complaints in the older population affecting roughly 25% (BP) and 20% (NP) of the population over 70 years on a monthly basis [9, 10]. BP is among the

most important factors affecting the physical health status in persons over 65 years [7], and both BP and NP are associated with a long list of other health problems and decreased overall physical function [9, 18, 22]. In spite of this, there is an under-representation of the older population in the BP and NP literature [1] and studies

addressing even basic features of these complaints are lacking.

We reported on the 1-month prevalence and development over time of BP and NP and associated social, lifestyle, and health factors based on data collections between 1995 and 2001 [9, 10] within the Longitudinal Study on Aging Danish Twins (LSADT), a population based cohort sequential study comprising all Danish twins aged 70 and older [5]. The purpose of the present paper is to report new and more extensive interview data on these conditions from the 2003 data collection wave including pain intensity, 1-year prevalence, duration of NP and BP within the past year, influence of BP and NP on daily activities and patterns of care seeking due to BP and NP.

Materials and methods

Study population and data collection

The Danish Twin Registry is the basis for the Longitudinal Study of Aging Danish Twins (LSADT), both of which have been described in detail [5, 10, 23]. In brief, LSADT is a nation wide population based cohort-sequential study of 70+ year-old Danish twins. Data collection has been performed every second year starting in 1995, however detailed information on BP and NP has only been included in the 2003 data collection wave which forms the basis of this cross-sectional analysis. The survey was conducted by trained interviewers with substantial experience in interviewing the elderly, was home based and consisted of an extensive battery of questions and tests of cognitive and physical functioning. The training of the interviewers included detailed instructions in interpretation of study questions and possible answers as well as physician directed courses dealing with the health issues included in the survey.

BP and NP was assessed using a modified version of the Standardised Nordic Questionnaire [12]. Interviewers were instructed that the back extended from the lower rib border to the gluteal folds and that the neck extended from the occiput to third thoracic vertebra and included the trapezius muscle but not the shoulder joint. Participants were asked the following questions regarding BP and NP: "Have you during the past month suffered from BP, acute low BP, or lumbago?" (yes/no), "Have you during the past month suffered from pain or stiffness in the neck or shoulders?" (yes/no), "If yes, how intense was this pain?" Possible answers were "stiffness but not really pain", "light pain", "moderate pain", and "severe pain". Then participants were asked "During the past 12 months, how many days have you had BP", "During the past year, how many days have you had NP", "Have you during the past year diminished or

modified your physical activities because of BP or NP" (yes/no), and finally "Have you during the past 12 months received treatment for BP by any of the following: General medical practitioner, medical specialist, hospital, chiropractor, physical therapist, other", more than one answer was possible. The same question was asked for NP.

Assessment of functional abilities was based on an instrument that has been validated in Denmark and has been shown to discriminate levels of functional abilities among community-dwelling elderly persons [21]. All items were rated on a 1–4 scale and, after a factor analysis, averaged into a strength score, which was subsequently adjusted for age and sex [6].

Data analysis

First, sex-specific prevalence estimates for the 1-month prevalence of BP and NP were calculated and intensity of possible NP and BP was tabulated. Differences between men and women were estimated using 95% confidence intervals (CI) and chi-square tests (Table 1). Then data on the duration of BP and NP during the past year was grouped into three categories as "0", " ≤ 30 days", and " > 30 days". This method has been used previously in epidemiologic studies on BP and NP based on the Standardised Nordic Questionnaire [8, 11, 17]. This information was tabulated for men and women separately along with information on diminished or altered physical activity due to BP or NP and informa-

Table 1 One-month prevalence of neck pain and back pain and pain intensity among Danish twins aged 72–102

Prevalence of neck and back pain	Males %, 95% CI	Females %, 95% CI
Neck pain past month	19 (16–22)	24 (22–27)
Back pain past month	20 (17–23)	30 (27–33)
Intensity of neck pain past month*	%, n	%, n
No pain	81 (665)	77 (789)
Stiffness but not pain	5 (38)	4 (40)
Light pain	6 (51)	6 (64)
Moderate pain	5 (44)	10 (102)
Severe pain	2 (17)	3 (34)
Intensity of back pain past month**		
No pain	81 (658)	72 (736)
Stiffness but not really pain	1 (7)	2 (18)
Light pain	7 (53)	8 (84)
Moderate pain	8 (66)	13 (129)
Severe pain	4 (31)	6 (62)

*Difference between men and women $p < 0.003$ (chi-square test);

**Difference between men and women $p < 0.0001$ (chi-square test)

tion on care seeking for NP or BP. Again differences between men and women were estimated using chi-square tests (Table 2). Strength scores, used as a continuous variable, for participants reporting BP or NP for more than 30 days out of the past year versus participants reporting no BP or NP during the past year were summarized, and odds ratios (OR) for lower strength score given BP or NP of longer duration versus no BP or NP were calculated. Finally, associations between (a) altered or decreased physical activity during the past year due to BP or NP or (b) seeking of treatment for BP or NP during the past year and duration of pain and pain intensity were estimated using logistic regression models controlled for the opposite variable and age and sex (Table 3).

Table 2 Neck pain (NP) and back pain (BP) past year, impact on physical activity and seeking of treatment during past year for Danish twins aged 72–102

	Males % (95% CI)	Females % (95% CI)
NP past year*		
0 days	84 (81–87)	80 (77–82)
≤ 30 days	6 (4–8)	8 (6–10)
> 30 days	10 (8–12)	12 (10–14)
Overall 1-year prevalence	16 (13–19)	20 (18–22)
Diminished physical activity due to NP past year	5 (4–6)	8 (7–10)
Treatment for NP past year, all	10 (8–12)	12 (10–14)
General practitioner	4	4
Medical specialist	1	1
Hospital	0.5	0.5
Chiropractor	1	1
Physiotherapist	2	5***
Other	5	5
BP past year**		
0 days	79 (76–81)	68 (65–71)
≤ 30 days	8 (6–10)	11 (9–13)
> 30 days	13 (11–15)	21 (19–23)
Overall 1-year prevalence	21 (19–23)	32 (29–35)
Diminished physical activity due to BP past year	9 (7–11)	16 (14–19)
Treatment for BP past year, all	13 (10–15)	19 (16–21)
General practitioner	6	7
Medical specialist	1	1
Hospital	2	2
Chiropractor	3	3
Physiotherapist	3	6***
Other	7	5

*Difference in prevalence and duration of NP between men and women $p=0.04$ (chi square test); **Difference in prevalence and duration of BP between men and women $p<0.001$ (chi square test); ***significantly more women than men seek care from physiotherapists $p<0.01$ (chi square test)

Results

1,844 of 2,186 invited Danish twins (84.4%) participated in the LSADT 2003 wave. 63 provided answers by proxy, most commonly due to dementia, and these were subsequently excluded from the analysis. The mean age of the participants was 80 years (range 72–102 years, standard deviation 5.7 years). The 1-month prevalence of BP and NP and intensity of this pain is reported in Table 1. Women report more BP and NP than men on a monthly basis and also consistently report more severe pain. The 1-year prevalence of BP and NP and the duration of this pain, impact on physical activity, and seeking of treatment is reported in Table 2. Interestingly, the 1-month prevalence estimates and the 1-year prevalence estimates are practically identical, however, again women consistently report more pain than men and also pain of longer duration. Overall, 7% of the participants had modified or diminished their physical activities due to NP and 13% due to BP during the past year (Table 2). 11% of participants had had some kind of treatment for NP during the past year and 16% of participants had had some kind of treatment for BP during the past year most commonly from a general medical practitioner or a physiotherapist (Table 2). Participants reporting NP or BP of longer duration (>30 days out of the past year) had significantly lower strength scores when compared to participants reporting 0 days with NP or BP during the past year. For NP the scores were 3.08 vs. 2.7 and for BP the scores were 2.73 vs. 2.06, and OR for lower strength score was 1.34 (95% CI 1.16–1.55) for NP and 1.42 (95% CI 1.25–1.62) for BP when comparing these groups. Both duration and intensity of pain are associated with modifying or diminishing physical activity and with seeking treatment for both NP and BP, however, duration appear to be more important than intensity (Table 3).

Discussion

We have previously shown that NP and BP are common symptoms in old age [9, 10], and results of the present study indicate that these symptoms are not negligible. 10–20% of women and around 10% of men report that they have moderate to severe NP or BP on a monthly basis, and overall 7% indicate that they have altered or diminished their physical activities due to NP, and 13% have altered or diminished their physical activities due to BP within the past year. Furthermore, 11% have had treatment for NP and 16% have had treatment for BP within the past year most commonly from general medical practitioners or physical therapists. Our population based estimates also indicate that around 10% of the population aged

Table 3 Associations between altered or decreased physical activity during the past year or seeking of treatment during the past year and duration or intensity of neck pain and back pain

	OR for association with duration of pain*	OR for association with intensity of pain**
Neck pain		
Altered or diminished physical activities	5.82 (3.91–8.64)	1.85 (1.48–2.31)
Seeking of treatment	2.62 (1.97–3.49)	1.62 (1.36–1.94)
Back pain		
Altered or diminished physical activities	6.57 (4.66–9.28)	1.46 (1.22–1.75)
Seeking of treatment	2.37 (1.78–3.15)	1.46 (1.23–1.72)

*Controlled for intensity of pain, sex, and age; **Controlled for duration of pain, sex, and age

70 or older have NP of longer duration (> 30 days) every year and around 20% have BP of longer duration on a yearly basis. Both NP and BP of longer duration were associated with significantly lower physical performance scores, and longer duration of pain was more strongly associated with altering or diminishing physical activities and seeking care than was intensity of pain.

Until recently reliable estimates of the occurrence and impact of NP and BP in seniors were unavailable [1]. However, Lavsky-Shulan and March, using study samples not directly comparable to ours, both found that BP and other musculoskeletal pain syndromes were common in the community dwelling elderly population and that these were associated with difficulty in performing activities of daily living and extensive care seeking [15, 19]. Interestingly, Leveille after interviewing more than 1,000 older women concluded that BP is associated with difficulty in performing daily activities but not with inability to do so [18], indicating that BP (and probably also NP) may be common, annoying and even strong but rarely disabling symptoms in old age. This is confirmed by Scudds who after surveying 1,306 community dwelling elderly persons over 65 years concluded that persons with musculoskeletal pain (including BP and NP) are three to seven times as likely as persons without pain to have difficulty in performing three or more common daily activities [22]. Consequently attention to NP and BP symptoms is in our opinion important when assessing the overall health of older people, but compared to the many disabling conditions affecting this age group, NP and BP may be of lesser importance in the disablement process even though both NP and BP are associated with significantly lower self-rated health scores [10].

Care seeking due to NP and BP was common in this sample (10–20% on a yearly basis). Lavsky-Shulan,

however, reported a much higher use of health care services (75% of their sample for BP alone) but this figure represented life time usage and is thus not directly comparable to our estimate [15]. The proportion of participants seeking care for NP is roughly equal to the proportion of participants with NP of longer duration (11%). However, a closer look at the raw data reveal that only about half (48%) of these have had treatment within the past year, the other half of the care seekers are constituted by participants with NP of shorter duration. Interestingly, two-thirds of the men and half of the women had sought chiropractic care for BP during their lifetime in the Iowa study [15], whereas in our study only between 1 and 3% had had chiropractic treatment during the past year. Even if the figures are not directly comparable due to period differences, we believe they also reflect different health care traditions and systems.

In older populations evaluation of leg pain in relation to BP may be of relevance. We did not evaluate leg pain in the LSADT study because the additional questions dealing with BP and NP included in the 2003 survey were added to an already very extensive and exhausting interview, and because the interviewers, in spite of thorough instructions and training, would not be able to clinically distinguish spinally related leg pain from leg pain due to other causes, i.e. osteoarthritis of the hips or knees or cardiovascular causes.

Twins have to be representative of the normal singleton population for these results to be valid on a larger scale and the representativeness of twin studies has indeed been questioned [20]. However twins, in spite of an average lower birth weight, have the same prevalence of many adult diseases, including diabetes mellitus [13], and thyroid disease [2], they have the same fecund ability as ordinary siblings [4], and the same ischemic heart disease mortality [24], and general mortality rate as the general population [3]. Furthermore, the prevalence of BP in younger twin samples have been found to be similar to prevalence estimates found in other population based studies from the Nordic countries [8, 16]. Therefore, twins are considered to be representative of the general population [14], and we found no reason to challenge this assumption.

The 1-month prevalence of both NP and BP are almost identical to the 1-year prevalence in this study. Knowing that both NP and BP are transient symptoms in old age [10], this questions the validity of both figures. However, the 1-month prevalences of both NP and BP found in the 2003 LSADT wave are identical to the prevalences found in the four previous waves and we therefore, believe that this is a robust estimate. The Standardised Nordic Questionnaire has been demonstrated to be reliable and valid in younger populations but has not been tested in seniors [12]. The present estimates of the 1-year period prevalence of

LBP is lower than the prevalences reported in younger Nordic populations (27% vs. 40%) [16] including Danish twin samples [8]. Further studies are needed to clarify whether older individuals are less likely to recall episodes of LBP dating further back than 1 month. The 1-year period prevalence reported in this study is probably too low even though data were collected using face-to-face interviews giving the possibility of clarifying questions and uncertainties from participants.

This cross-sectional study adds to the understanding of NP and BP in old age. Future longitudinal studies are needed to address possible causal relationships between health and lifestyle factors such as depression and physical ability and activity and NP and BP and other

factors. Such analyses are currently being planned within the LSADT collaboration.

Conclusion

NP and BP are common symptoms in old age and 10–20% of persons over 70 reports moderate or severe NP or BP on a monthly basis. Overall, older women report more BP and NP than older men. Altering or diminishing physical activities and seeking of treatment due to NP or BP are relatively common in the older age groups, again especially among women. 1-year prevalence estimates of NP and BP in seniors may suffer from recall bias.

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