



## **Short communication**

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by [Mirbod SM](#), [Inaba R](#), [Iwata H](#)

**Key terms:** [cross-sectional study](#); [prevalence](#); [questionnaire](#)

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## Subjective symptoms among motorcycling traffic policemen

by Seyed Mohammad Mirbod, PhD,<sup>1</sup> Ryoichi Inaba, MD,<sup>1</sup> Hirotoshi Iwata, MD<sup>1</sup>

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**Objectives** This study investigated the prevalence of subjective symptoms among current and former motorcycling policemen.

**Methods** The subjects of this study consisted of 46 current and 72 former motorcycling traffic policemen from a certain city located in the central part of Japan. They were requested to reply to questions on a self-administered questionnaire regarding age, work history, and subjective symptoms (16 items) during the month preceding the completion of the questionnaire.

**Results** Shoulder stiffness and low-back pain were frequently encountered. On the whole, the prevalence of subjective symptoms was higher among the current motorcycling policemen, even though they were younger. Assessing the prevalence of subjective symptoms by the median value of experience of motorcycle riding revealed that the high-exposure subgroup in the group that currently ride motorcycles had higher prevalence rates for all the symptoms.

**Conclusions** The prevalence of subjective symptoms among currently motorcycling traffic policemen seems to be transient, and it declines after the cessation of motorcycle riding or the reallocation to other worktasks, such as office work.

**Key terms** cross-sectional study, prevalence, questionnaire.

Policemen in general experience many occupational demands with physiological and psychological effects that could be harmful to their health. Traffic policemen are exposed to environmental pollutants during their outdoor job activities (1, 2) and to radiation emitted from handheld radar equipment used to control highway traffic (3). Motorcycling traffic policemen can be exposed to cold, they can experience strain in their hands and arms, or they can develop physical stress due to the unnatural posture of the trunk during motorcycle riding. Hence it can be anticipated that, in this occupation, subjective symptoms such as pain, numbness, or stiffness in the upper and lower extremities might be experienced within an extended period of work as a traffic policeman.

The objective of this study was to investigate subjective symptoms in two groups of traffic policemen, a group of policemen who currently ride police motorcycles and one of traffic police officers who have all had past experience of motorcycle riding but at present are engaged only in office duties.

### Subjects and methods

This study was conducted among all the traffic policemen in a certain city located in the central part of Japan. The subjects were divided into two groups, 46 traffic policemen currently riding motorcycles (group A) and 72 traffic police officers with past experience of riding police motorcycles but at present engaged only in office duties (group B) (table 1). These subjects were considered to be representative of traffic policemen of middle-sized cities in Japan. Through the traffic police headquarters, a questionnaire covering age, occupational career, years of motorcycle riding, and subjective symptoms (16 items) was sent to the subjects. The questionnaire was a slightly modified version of that used in our previous study (4). The participants were questioned as to whether they had any of the investigated symptoms during the month preceding the completion of the questionnaire. The subjective symptoms were classified into three categories of frequency: almost always, sometimes, or rare (none). All the subjects in both groups replied to the questionnaire.

<sup>1</sup> Department of Hygiene, Gifu University School of Medicine, Gifu, Japan.

Reprint requests to: Dr SM Mirbod, Department of Hygiene, Gifu University School of Medicine, 40 Tsukasa-Machi, Gifu 500, Japan [e-mail: mirbod@cc.gifu-u.ac.jp].

**Table 1.** Motorcycling traffic policemen's age, years of motorcycle riding, and length of occupational career.

	Age (years)			Experience of motorcycle riding (years)			Length of occupational career (years)		
	Mean	SD	Range	Mean	SD	Range	Mean	SD	Range
Current motorcycling policemen									
0—6 years' experience (N = 21)	28.8	4.6	21—41	2.9	1.9	0.5—6	9.8	4.6	2—22
≥ 7 years' experience (N = 25)	36.9	6.1	28—48	12.3	4.7	7—22	17.9	6.1	9—29
Former motorcycling policemen									
0—8 years' experience (N = 39)	38.5	6.2	29—50	5.9	1.7	2—8.7	19.5	6.2	10—31
≥ 9 years' experience (N = 33)	44.3	4.0	33—51	12.0	3.0	9—20	25.3	4.0	14—32

**Table 2.** Prevalence of subjective symptoms in two groups of motorcycling traffic policemen.

Subjective symptoms	Current motorcycling traffic policemen (N = 46)						Former motorcycling traffic policemen (N = 72)					
	Symptom frequency						Symptom frequency					
	Almost always		Sometimes		None		Almost always		Sometimes		None	
	N	%	N	%	N	%	N	%	N	%	N	%
Finger cold sensation	—	0.0	6	13.0	40	87.0	1	1.4	8	11.1	63	87.5
Numbness in fingers	3	6.5	8	17.4	35	76.1	2	2.8	10	13.9	60	83.3
Pain in fingers	1	2.2	4	8.7	41	89.1	—	0.0	1	1.4	71	98.6
Stiffness in fingers	—	0.0	9	19.6	37	80.4	—	0.0	10	13.9	62	86.1
Raynaud's phenomenon	—	0.0	2	4.3	44	95.2	—	0.0	3	4.2	69	95.8
Pain in arms	1	2.2	3	6.5	42	91.3	—	0.0	6	8.3	66	91.7
Pain in shoulders	1	2.2	5	10.9	40	87.0	1	1.4	9	12.5	62	86.1
Shoulder stiffness	7	15.2	19	41.3	20	43.5	10	13.9	18	25.0	44	61.1
Pain in neck	2	4.3	8	17.4	36	78.3	2	2.8	11	15.3	59	81.9
Neck stiffness	5	10.9	14	30.4	27	58.7	8	11.1	13	18.1	51	70.8
Low-back pain	13	28.3	15	32.6	18	39.1	13	18.1	17	23.6	42	58.3
Hearing difficulty	5	10.9	5	10.9	36	78.3	1	1.4	9	12.5	62	86.1
Tinnitus	1	2.2	7	15.2	38	82.6	—	0.0	7	9.7	65	90.3
Headache or dull head	2	4.3	6	13.0	38	82.6	1	1.4	5	6.9	66	91.7
Diarrhea	2	4.3	15	32.6	29	63.0	1	1.4	13	18.1	58	80.5
Abdominal pain	—	0.0	14	30.4	32	69.6	1	1.4	8	11.1	63	87.5

The mean age of the subjects in group A (N = 46) was 33.2 (SD 6.8) years, and that of the subjects in group B (N = 72) was 41.2 (SD 6.0) years. The mean length of occupational career was 14.2 (SD 6.8) years for those in group A and 22.2 (SD 6.0) years for the subjects in group B. The mean length of experience of motorcycle riding in group A was 8.0 (SD 6.0) years, and the past experience of motorcycle riding in group B was 8.7 (SD 3.9) years. The mean length of daily motorcycle riding in group A was 5.6 (SD 0.7) h/day and the past experience of daily motorcycle riding in group B was 5.4 (SD 0.9) h/day.

### Results

Table 2 shows the prevalence of subjective symptoms for the two groups of traffic policemen. Complaints regarding shoulder stiffness and low-back pain were the most frequent. In both groups the prevalence of subjective symptoms with the "almost always" frequency was

very low; hence, "almost always" and "sometimes" responses were combined to indicate the presence of a symptom. Figure 1 shows a comparison of the prevalence of subjective symptoms in the two groups. On the whole, the prevalence of subjective symptoms was higher among the subjects in group A than in group B. In table 3 the prevalence rates of subjective symptoms are presented according to the median value of current or former experience of motorcycle riding.

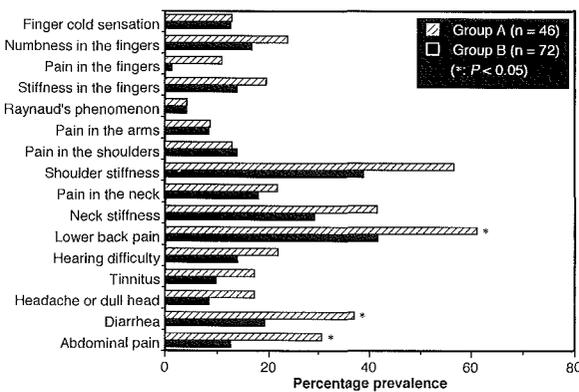
### Discussion

When the findings of this study are considered, several possible limitations should be taken into account. First, the questionnaire used was designed by our research group; consequently, it may have some limitations in recording the symptoms accurately. The implicit argument underlying the method is the relevance of symptoms recorded in this study. Since the magnitude of the symptoms was not described, we could not detect

**Table 3.** Prevalence of subjective symptoms in two groups of motorcycling traffic policemen by the median value of motorcycle riding experience of each group.

Subjective symptoms	Motorcycle riding experience							
	Current motorcycling policemen				Former motorcycling policemen			
	0—6 years (N = 21)		≥ 7 years (N = 25)		0—8 years (N = 39)		≥ 9 years (N = 33)	
	N	%	N	%	N	%	N	%
Finger cold sensation	2	9.5	4	16.0	4	10.3	5	15.2
Numbness in fingers	2	9.5	9	36.0*	5	12.8	7	21.2
Pain in fingers	2	9.5	3	12.0	—	0.0	1	3.0
Stiffness in fingers	2	9.5	7	28.0	4	10.3	6	18.2
Raynaud's phenomenon	—	0.0	2	8.0	—	0.0	3	9.1
Pain in arms	1	4.8	3	12.0	2	5.1	4	12.1
Pain in shoulders	2	9.5	4	16.0	5	12.8	5	15.2
Shoulder stiffness	10	47.6	16	64.0	14	35.9	14	42.4
Pain in neck	2	9.5	8	32.0	6	15.4	7	21.2
Neck stiffness	6	28.6	13	52.0	10	25.6	11	33.3
Low-back pain	12	57.1	16	64.0	17	43.6	13	39.4
Hearing difficulty	1	4.8	9	36.0*	3	7.7	7	21.2
Tinnitus	—	0.0	8	32.0**	4	10.3	3	9.1
Headache or dull head	—	0.0	8	32.0**	1	2.6	5	15.2
Diarrhea	3	14.3	14	56.0**	5	12.8	9	27.3
Abdominal pain	1	4.8	13	52.0**	4	10.3	5	15.2

\* P < 0.05 and \*\* P < 0.01 (compared with the subgroup whose experience of motorcycle riding was 0—6 years).



**Figure 1.** Comparison of the prevalence of subjective symptoms of policemen who currently ride police motorcycles (group A) and those who have had past experience with motorcycle riding (group B).

whether or not they cause impairment or perhaps even decreased work ability for motorcycling policemen. It would also have been desirable to test the validity and repeatability of the questionnaire.

Second, because of the cross-sectional nature of the study, the analysis involved only prevalent cases. The number of subjects was also small, and therefore the possibilities to analyze the data properly and draw conclusions were restricted.

Despite these reservations, the present findings suggest that the investigated subjective symptoms are more prone to occur in policemen who are currently riding police motorcycles and that, even with the small size of the survey population, the difference in prevalence for some symptoms, such as low-back pain and abdominal pain (figure 1), was significant when compared with that of traffic police officers who had ceased riding motor-

cycles and were involved only in office duties. Assessing the prevalence of subjective symptoms from the median value of motorcycle riding experience revealed that the high-exposure subgroup in group A had higher prevalence rates for all the symptoms (table 2). In a longitudinal study, Schibye et al (5) reported that symptomatic sewing machine operators who changed jobs were much more likely to be relieved of their symptoms than were symptomatic operators who continued sewing. In a historical cohort study, Anderson & Gaardbore (6) showed that current sewing machine operators had about a 2-fold higher risk of neck and shoulder pain than those who stopped sewing. Although the data of our study were collected in a cross-sectional manner, the general conclusion is in fairly good agreement with that of the mentioned studies — namely, in some occupations subjective symptoms among currently exposed workers are reversible and may be influenced by a reallocation to other worktasks. In short, subjective symptoms of currently motorcycling policemen can be regarded as transient, and they are symptoms which seem to decline after the cessation of motorcycle riding (ie, when doing only office work) (promotion).

The higher prevalence of subjective symptoms among the motorcyclists in group A can be thought of as a consequence of current exposure to cold, segmental and whole-body vibration, the posture of the hands and arms during the gripping of the handlebars, the surrounding environment, and the daily hours of motorcycle riding. Mechanical stress on the spine from the sitting posture and from vibration has been incriminated in association with low-back pain and driving a motor vehicle (7). Additional study on the hand-arm vibration syndrome

and ergonomic problems has been undertaken for these problems.

In the present study we did not evaluate work-related stress among the subjects; however, it is generally accepted that police officers have a particularly stressful job. Investigations have shown that type A behavior, such as time urgency, was a predictor of neck and shoulder disorders (8). Some symptoms, such as abdominal pain and diarrhea, might also be related to stress during work time (9, 10). Future studies on psychological factors in the work environment of traffic police would further our understanding of why current police motorcyclists suffer more from subjective symptoms.

#### *Concluding remarks*

The results of this study can be used as the basis for building hypotheses to initiate and execute a directed study on subjective symptoms among a larger number of traffic policemen. The results of this study suggest that the subjective symptoms of currently motorcycling policemen are transient and might not be an indication of any disorder with much consequence. It was suggested that, for active traffic police motorcyclists, measures such as ergonomic training and education on physical exercise to accelerate recovery from localized fatigue should be initiated. Such a program would offer great promise for reducing the physical stress and the risk of subjective complaints of this occupational group.

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