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PATTERN OF DEGENERATIVE SPINAL CANAL STENOSIS IN SOUTH OF IRAQ. A REVIEW OF 1699 CASES

Thamer A Hamdan,
FRCS(Orth.), Professor of Orthopedic Surgery, College of Medicine, University of Basrah, Iraq.

Abstract

Background context: Both systemic hypertension and degenerative spinal canal stenosis are common diseases in the population, however, the cross relationship had not been reported.
Purpose: To determine the incidence of systemic hypertension among patients with degenerative spinal canal stenosis and to describe the pattern of this degenerative spinal canal stenosis in south of iraq.
Study design: Retrospective and prospective review.
Patient sample: A total of 1699 persons (644 females and 1055 males) whom their blood pressure measured. A 326 patients had degenerative spinal canal stenosis and 1373 not had spinal stenosis {599 patients had prolapsed intervertebral disc prolapse operated on(control no.1 group) and 774 persons were normal (control no.2 group)}.
Outcome measure: Postoperative blood pressure monitoring.
Methods: Systemic blood pressure measurement were reviewed for all of the 1699 persons with postoperative follow up of their blood pressure, also the level of pathology was recorded.
Results: Systemic hypertension was present in 46% of patients with degenerative spinal canal stenosis, 18.1% of patients with intervertebral disc prolapse (control no.1) and in 17.4% of normal persons(control no.2). Postoperativly, hypertension resolved spontaneously or easily controlled with less number and lower doses of antihypertensive drugs.
Conclusion: Systemic hypertension highly prevalent among patients with spinal stenosis and disappear or becomes lower after operative treatment.

Introduction

The spinal canal is bordered anteriorly by the vertebral body, intervertebral disc, and posterior longitudinal ligament; posteriorly by the laminae, pars interarticularis, ligamenta flava, and facet joints; and laterally by the pedicles[1]. Spine related pain and disability are some of the greatest preoccupations of clinicians and patients. Beyond 'normal' aging of the elements of the spine, absolute degeneration of these spinal substructures eventually occurs. This at some point entails a superoinferior narrowing and eventual collapse of the intervertebral disc. Preceding or accompanying these discal alterations, significant degenerative changes also occur in the nondiscal structures of the spinal column and related tissues, including the posterior spinal facet joints, the spinal ligaments, the underlying bone of the posterior bony elements of the spine and the perispinal muscles[2].

In a group of 100 patients, Amundsen et al. found back pain and sciatica present in 95% and claudication present in 91%. Sensory disturbance in the legs was present in 70%, with motor weakness in 33%, and voiding disturbance present in only 12% of patients. Bilateral leg complaints were present in 42%, and unilateral leg symptoms were present in the other 58%. Distribution of symptoms was L5

in 91%, S1 in 63%, L1-4 in 28%, and S2-5 in 5%. Forty-seven patients (47%) had symptoms specific for two nerve roots, and 35% had monoradiculopathy. Three and four level radicular complaints were recorded in 17% and 1%, respectively[3].

Hypertension is defined as a systolic blood pressure higher than 140 mmHg or a diastolic blood pressure higher than 90 mmHg; the diagnosis is based on the average of 2 or more readings taken at each of 2 or more visits after an initial screening[4,5]. When determined by these criteria, hypertension affects 20% to 30% of the adult population in most developed countries, and its prevalence appears to increase with the age of the patient[6-8].

Both hypertension and spinal stenosis appears to increase with the age of patient, however prior literatures had not been provided a relationship between spinal stenosis and hypertension. To our knowledge this is the first study of its kind to specifically evaluate this relationship.

Materials and methods

Study design

This is a retrospective and prospective review of 1699 persons since January-2000 to July-2007, all operations done by one spine surgeon in single institution. Criteria for inclusion in the study included patients with degenerative spinal canal stenosis operated on, patients with prolapsed intervertebral disc operated on and a sample of normal persons. Exclusion criteria include all other causes of spinal stenosis and presence of secondary causes of systemic hypertension.

Patients population

A total of 1699 persons were included in this study (table I). Patients were 326 with degenerative spinal stenosis and 1373 persons did not had spinal stenosis (the control no.1 group consist of 599 patients with intervertebral disc prolapse and control no. 2 group consist of 774 normal persons), patients with spinal stenosis or disc prolapse were their blood pressure monitered postoperatively, even young persons included to further verifying the significance of hypertension relation to spinal stenosis. Distribution of persons according to age and sex shown in table I & II respectively.

Blood pressure monitoring

A sphygmomanometer used to measure systemic blood pressure at brachial artery in supine and standing positions by a physician at two occasions repeated postoperativly, also treatment regimen of hypertension reviewed, the upper limits of normal blood pressure regarded as 140/90 mmHg

Diagnosis of spinal stenosis

History, physical examination, MRI and operative findings used to diagnose spinal stenosis and disc prolapse and to detect exclusion criteria.

Results

Hypertension present in 150 (46%) patients with degenerative spinal stenosis, those patients were 69 (46%) females and 81 (54%).

Regarding the region of degenerative spinal stenosis, it was found that 260 (79.8%) patients had lumbar stenosis and cervical stenosis in 66 (20.2%) patients. Spinal stenosis was multiple in 187 (57.3%) patients, this include 55 of 66 (83.3%) patients with cervical stenosis and 132 of 260 (50.8%) patients with lumbar stenosis and this agrees with the study done by Amundsen et al[3].

The percentage of systemic hypertension according to age groups of patients with spinal stenosis as compared to persons with intervertebral disc prolapse and normal people were shown in table III.

The prevalence of hypertension among patients with spinal stenosis and disc prolapse was higher than in spinal stenosis alone (this is a significant relationship as the P-value was less than 0.05) as shown in table IV.

Blood pressure either resolves spontaneously or becomes lower and easily controlled after operation for spinal stenosis, no patient had worse blood pressure after operation.

Discussion

Our study was to get the prevalence of systemic hypertension among patients whom had degenerative spinal stenosis. We found that systemic hypertension was present more in patients with degenerative spinal stenosis (46%) and this is a highly significant (P-value <.001) than those with disc prolapse (18.1%) or normal people (17.4%).

Prevalence of systemic hypertension increases with the increase of age of patients with spinal stenosis, also it was more in males (54%) than in females (46%) with degenerative spinal stenosis as it was noticed previously in medical studies[6-8].

Spinal stenosis is more common in lumbar region (79.8%) than cervical region (20.2%), Multiple levels spinal stenosis was more common than single level spinal stenosis, The most common levels of spinal stenosis were L4-L5 and C5-C6 and this agrees with Amundsen et al. and was proved in their study[3].

High prevalence of systemic hypertension among patients with spinal stenosis can be explained by direct and indirect relationship:

Direct: 1. Pain may be very sever causing increase sympathetic stimulation (increase catecholamines release) and increased blood pressure.

2. There may be a compression of renal sympathetic nerves resulting in vasoconstriction of afferent arterioles and hypertension.

3. Compression of urinary bladder sympathetics L2-L3 or parasympathetics S2-S3 cause bladder distension which cause reflex increase in heart rate and blood pressure.

Indirect: 1. bed rest (predispose to obesity) and non-steroidal anti-inflammatory drugs used in treatment of spinal stenosis, both predisposes for hypertension.

2. Some antihypertensive drugs act by causing systemic venous dilatation and this cause venous congestion at the spine resulting in bone overgrowth and spinal stenosis.

Recommendation

Very special attention must be given to the blood pressure status in patients with degenerative spinal stenosis.

Very special attention must be paid to the endotracheal intubation during general anaesthesia (hyperextension of the neck is very risky).

Presence of hypertension with spinal stenosis is a relative indication for surgery.

Antihypertensive drugs should be lowered after surgical decompression of a hypertensive patient with spinal stenosis.

We advice a further study on the relationship between patient occupation and development of spinal stenosis.

Conclusion

Systemic hypertension was more prevalent in patients with spinal stenosis than others, more in males than females and in lumbar region more than in cervical regions.

Symptoms of spinal stenosis depends on size of spinal canal, occupation of patient and presence of additional factors (disc, tumour, infection).

Blood pressure becomes lower after surgical decompression of spinal canal of patients with spinal stenosis.

It was difficult to control a normal level of blood pressure in patients with degenerative spinal stenosis.
Profuse bleeding occur during surgical decompression of spinal canal due to congestion of venous plexus and it occur more frequently in patients degenerative spinal stenosis.

Table I: Age distribution

Age (years)	Numbers	Percentage(%)
15-39	598	35.2
40-49	390	23
50-59	349	20.5
60-69	253	14.9
70-85	109	6.4

Table II: Persons distribution according to gender and presence or absence of degenerative spinal stenosis

	Spinal stenosis		No spinal stenosis	
	Number	Percentage	Number	Percentage
Females	119	36.5%	525	38.3%
Males	207	63.5%	848	61.7%
Total	326	19.1%	1373	80.9%

Table III: Percentage of hypertension according to age groups of persons with spinal stenosis, disc prolapse and normal people

	Spinal stenosis	Disc prolapse (control 1)	Normal persons (control 2)
17-39 yr.	13.6%	13.4%	1.3%
40-49 yr.	36.2%	19.1%	8%
50-59 yr.	55.6%	25%	24.5%
60-69 yr.	51.7%	40.7%	36.1%
70-82 yr.	60.6%	57.1%	39.1%

Table IV: Prevalence of hypertension among patients with stenosis alone as compared to patients with stenosis and disc prolapse.

	Stenosis alone	Stenosis and disc prolapse
17-39 yr.	16 %	12.5 %
40-49 yr.	28.9 %	50 %
50-59 yr.	50 %	67.8 %
60-69 yr.	50 %	53.3 %
70 -82 yr.	57.1 %	80 %

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