"MECHANICAL BACKACHE"—THE MOST COMMON TYPE OF LOW BACK PAIN

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BECAUSE low back pain is so commonly encountered, the physician must learn to recognize accurately the various causes of backache and to institute the proper treatment himself or direct the patient to another physician who is capable of carrying out the necessary treatment. The physician's lack of interest in this important problem accounts for the prevalence of various medical cults which specialize in the treatment of back pain.

To maintain the erect position, one must have good body balance. This balance may be upset by the presence of certain mechanical factors such as faulty posture, obesity, relaxed abdominal musculature, weak back musculature, and inequality of length of the lower extremities. When backache is caused by some disturbance in the normal body balance through the action of one or more of these mechanical factors, the condition is called a "mechanical backache." The same mechanical factors often play a significant role in producing at least a portion of the low back pain associated with fibrositis, hypertrophic arthritis, rheumatoid spondylitis, spondylolisthesis and other causes of backache. Nevertheless the term "mechanical backache" should be reserved for the case in which there is no demonstrable pathologic condition to account for the pain within the back or pelvis other than mechanical factors.

Good posture is essential to good body balance. When a person stands correctly, a perpendicular line dropped from the ear should pass through the shoulders, hips and ankle joints (fig. 1a). With good posture, the head is high, chin up and in, chest up, shoulders relaxed and back, abdomen flat, lower back flattened, knees straight, and feet parallel. Little actual muscle energy is required to maintain the erect position with good posture because the body is so rightly balanced. It is easy to see, however, how quickly normal body balance is upset by a sagging abdomen, a flattened chest, humped shoulders and a swayed back (fig. 1b). With poor posture, unnatural stresses and strains are thrown upon the muscles and ligaments which support the vertebral column, and these stresses and strains become most pronounced at the lumbosacral joint. Discrepancy in length of the lower extremities of one-half inch or more may also cause sufficient tilting of the pelvis to produce abnormal strain of the back musculature. A normal pelvis may compensate satisfactorily for a shortening of as much as one and one-half inches in one leg; but a greater discrepancy in leg length cannot be counteracted by pelvic tilt alone without causing scoliosis. Unless the patient wears on the shoe of the short leg an elevation of sufficient height to reduce the discrepancy to a value comfortably equalized by lateral tilting of the pelvis, pain in the lower back may result. It is unusual for a discrepancy in leg length of one-half inch or less, to cause pain in the lower back because of strain on back musculature.

"Mechanical backache" is much more frequently encountered in women

than in men. This is because of the prevalence among women of obesity, poor posture, and weak musculature. Low back pain may be the presenting symptom in cases of chronic nervous exhaustion. This condition, also, is more common in women than in men.

Diagnosis

The diagnosis of a "mechanical backache" should be made only after carefully evaluating the patient's history, physical condition and roentgenograms of the lumbo-sacral spine. The physician cannot omit any one of these three items. This diagnosis indicates that no actual disease or permanent structural abnormality is responsible for the backache.

The usual history is one of a gradual onset of low back pain. This may be well localized to the lumbo-sacral region, but often the patient complains of diffuse discomfort across the entire lower back extending into the buttocks; there is no radiation of the pain into the lower extremities. The back pain is usually of many years' duration, although the patient is infrequently incapacitated since the pain is seldom severe. The attacks of pain are more likely to be an acute muscular and ligamentous strain superimposed upon, and perhaps precipitated by, the factors producing a "mechanical backache."

The pain of a "mechanical backache" is aggravated by activity and relieved by rest. Standing or sitting for lengthy periods may increase the discomfort. Changes in weather have no effect on the patient's symptoms; coughing, sneezing and straining have little effect on the pain.

While undergoing examination, the patient should be completely disrobed, or partially covered so that an adequate view of the entire back may be obtained. Usual factors contributing to "mechanical backache" are faulty posture with increased lumbar lordosis and increased rounded dorsal kyphos. There often exist varying degrees of obesity with a prominent sagging abdominal panniculus. Corpulence is not an essential diagnostic criterion, however, since the tall, thin person sometimes has faulty posture with weak back and abdominal musculature. There is often localized tenderness in the region of the lumbo-sacral joint and over the iliolumbar ligaments. Movements of the back may or may not be restricted; limitation of back motion is not an essential physical finding. There is a normal range of hip motion. Raising the body from the supine to the sitting position without support of the arms is often difficult, depending upon the degree of weakness of back and abdominal musculature. There is no evidence of any peripheral nerve irritation; knee and ankle reflexes are equal and active. The "straight leg raising" test is negative; that is, with the patient supine, the lower extremity can be elevated passively, with knee completely extended, to a position of almost 90 degrees without undue discomfort. Should there be discomfort associated with this test it occurs in the hamstring tendons back of the knee due to the normal tightening of these structures. The legs are measured from the anterior superior iliac spine to the medial malleolus. A discrepancy of one-half inch or more in leg length is possibly significant in causing low back pain.

Roentgenograms of the lumbo-sacral spine should be studied carefully with particular attention to the presence of arthritic changes or structural abnor-

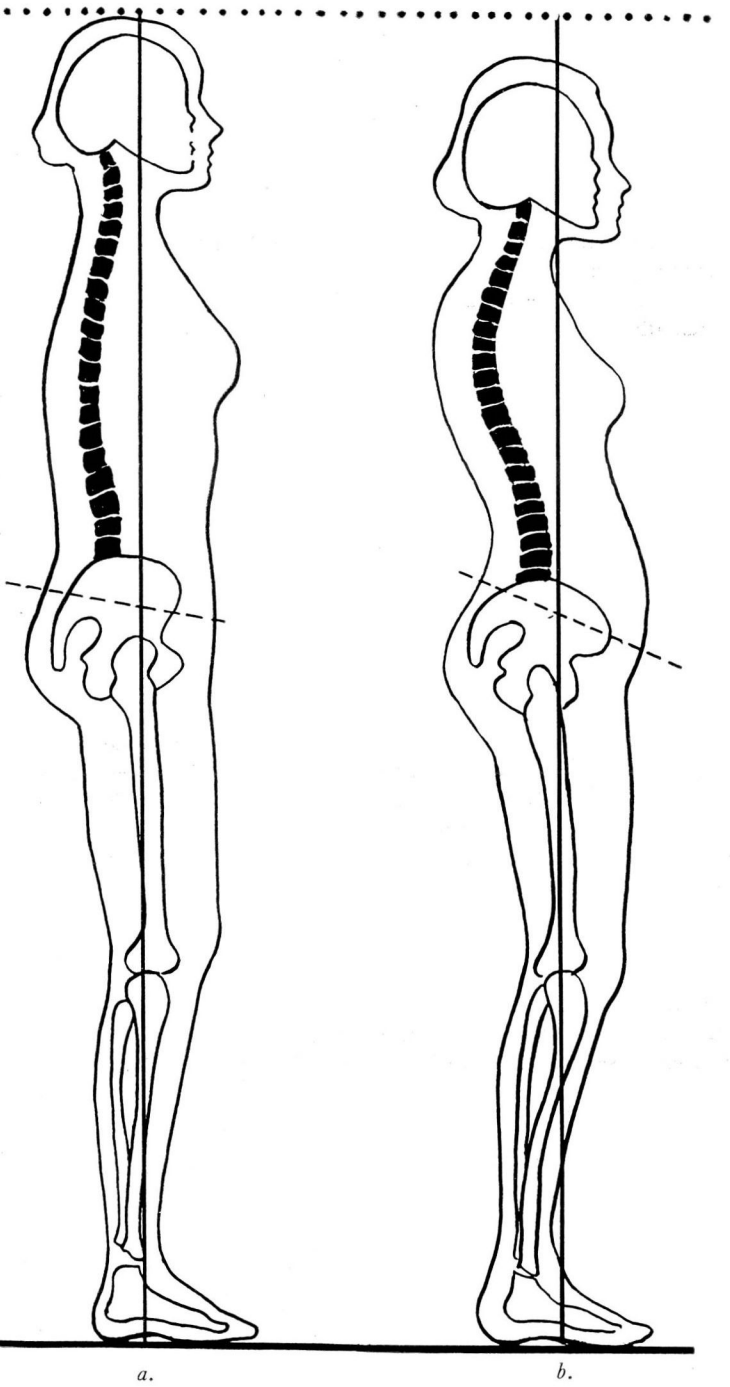

FIG. 1. (a) Standing with good posture, a perpendicular line dropped from the ear passes through the shoulders, hips and ankle joints. (b) Normal body balance is upset by a sagging abdomen, a flattened chest, humped shoulders and a swayed back, producing a "mechanical backache."

malities involving the lower lumbar spine. In the simple "mechanical backache," nothing abnormal is noted.

Differential Diagnosis

Chronic fibrositis, so-called "muscular rheumatism," is often associated with the syndrome of "mechanical backache." In these cases there frequently are "trigger points," or localized areas of severe tenderness. Patients also complain of stiffness in the back muscles following a period of inactivity; this stiffness is usually most severe on arising and subsides during the day.

An acute muscular and ligamentous strain involving the lumbar spine may easily become a chronic one if the original injury is neglected and if one or more of the mechanical factors described are already present.

In cases of rheumatoid spondylitis, motions of the spine are restricted oftener than in a "mechanical backache." The Marie-Strümpell type of spondylitis is found more frequently in men than in women and is characterized by tenderness over the spine, limited chest expansion, and the typical roentgenographic appearance of sacro-iliac calcification in the paraspinal ligaments.

The roentgenograms also serve to differentiate between a "mechanical backache" and a backache due to other lesions.

Treatment

Once the diagnosis of a "mechanical backache" has been established, the physician may assure his patient that the condition may be alleviated by certain simple measures. The patient should be urged to sleep on a firm bed. A piece of plywood between the mattress and springs is advisable, and a stiff cotton or felt mattress is better than an innerspring mattress. This firm bed prevents further strain to the back musculature.

Heat aids in the relaxation of the back muscles and stimulates circulation. The patient is advised to take a hot tub bath nightly, remaining in the water for a period of five to ten minutes. This should be followed by twenty to thirty minutes of heat application on the lower back, employing an infra-red lamp or a heating pad. A brief gentle massage applied to the patient's back is helpful, but not an essential part of the treatment. The patient then performs the series of exercises which have been prescribed by the physician and in which he or she has been carefully instructed. It is not enough to advise a patient to take exercises. He must be shown exactly how to perform them, and the description of the exercises should be written down and given to the patient for ready reference. Too much exercise is unwise at first because of the danger of over-taxing the already weakened back musculature. If possible, the exercises should be done both morning and night. It is imperative to do them at least once every day. The patient should be advised that little improvement in the condition can be anticipated for at least two months, since it will take this period of time to strengthen the back musculature satisfactorily. In most cases some improvement will be noted before the two month period has elapsed.

The following list of simple postural exercises will be found adequate for most cases of "mechanical backache." If possible, each exercise should be done

five times at the onset and gradually increased over a period of several weeks or months to ten or fifteen times, depending upon the exercise tolerance of the individual patient.

A. Lie on back with knees bent:
   1. Tilt the pelvis, flattening the lower back against the floor.
   2. With pelvis tilted, raise the head and shoulders from the floor.
   3. With pelvis tilted, raise legs alternately.
   4. With pelvis tilted, straighten out one leg and then the other.

B. Stand with heels four to six inches from the wall and with back against the wall:
   1. Tilt the pelvis, flattening the lower back against the wall.
   2. With back flat, leave the wall; come up and down on toes; return to wall.
   3. With back flat against the wall, raise legs alternately.
   4. With back flat, walk away from the wall.

If more vigorous exercises are indicated to strengthen the back and abdominal muscles, the following may be prescribed:

1. Lie on back, elevate both legs with knees completely extended.
2. Lie on back with arms overhead, rise to sitting position and touch toes.
3. Lie on abdomen with arms at side, raise head and shoulders, arching back.

Physical therapy treatments—*diathermy or radiant heat and massage*—may be administered several times a week, but are not essential. A corset is recommended only if the patient is quite obese and the abdominal musculature especially relaxed. In "mechanical backache," a corset must be considered a temporary relief measure, to be discarded when the back becomes strong enough to get along without it. The wearing of a corset for a long period of time delays the permanent cure, although the immediate effect may be beneficial.

General systemic measures may be an important adjunct in the treatment of the "mechanical backache." Vitamin supplements may be indicated, a weight reduction diet may be needed, and a mild sedative or a tonic may be prescribed by the physician in a particular case. Proper treatment must also be instituted to control any other disease which may be present, such as chronic cholecystitis, peptic ulcer, or an irritable bowel. It is important to tell the patients, however, that such treatment is directed toward improving their general health and is not specifically prescribed for the cure of the backache.

Conclusion

The "mechanical backache" is the most common type of low back pain. Because the condition is seldom incapacitating, the physician is apt to minimize its importance. Once the diagnosis has been made by careful examination, an adequate program of treatment should be promptly instituted.