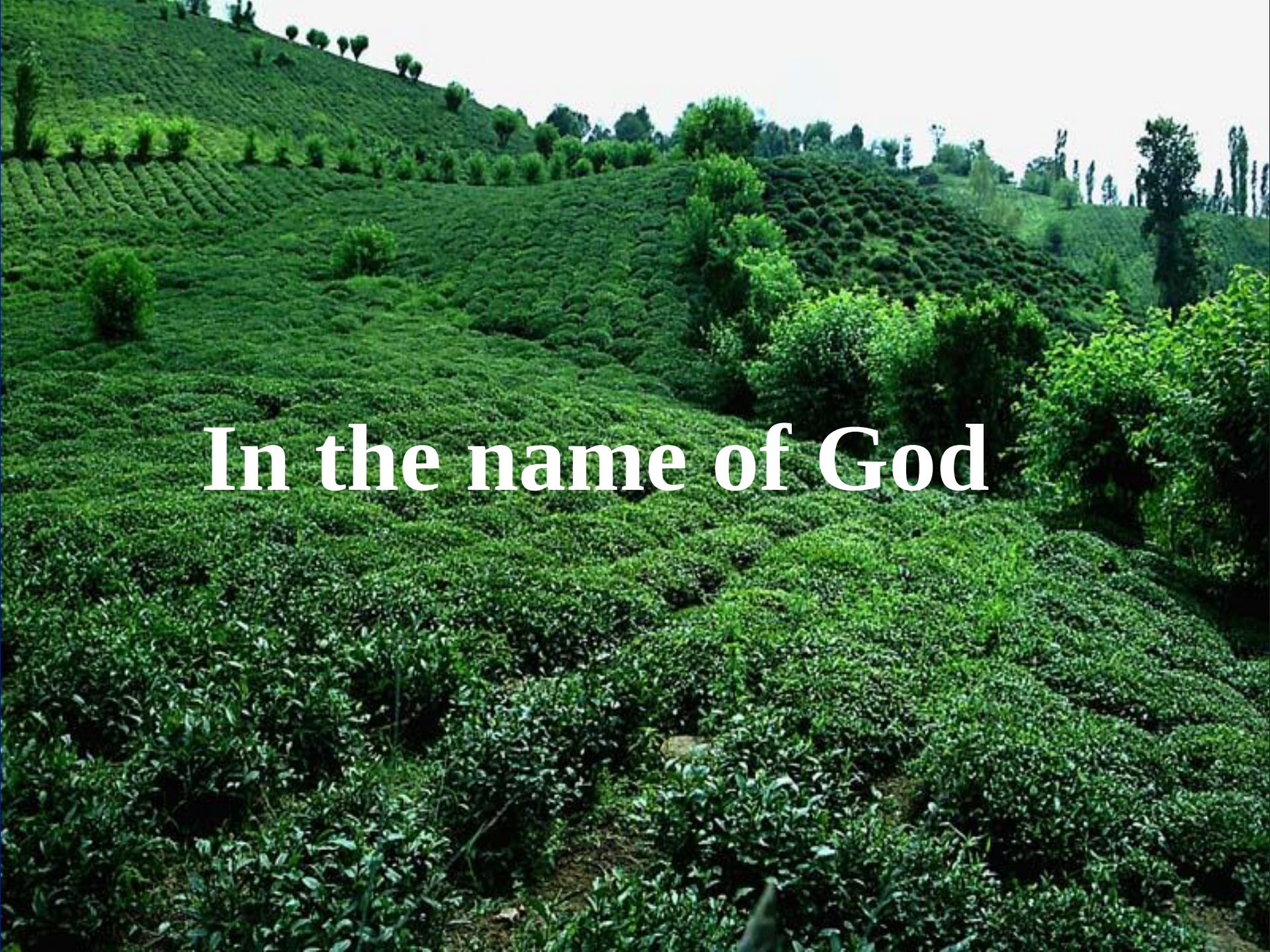


A photograph of a vast tea plantation on a rolling hillside. The tea bushes are arranged in neat, terraced rows that follow the contours of the land. The foliage is a vibrant green. In the background, a line of taller trees marks the horizon under a clear sky. The text "In the name of God" is superimposed in the center of the image in a white, serif font.

In the name of God

Low back pain

(Epidemiology and Classification)

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27 Oct 2017

Introduction

- Low back pain is a symptom rather than a disease.
- Like other symptoms, such as headache and dizziness, it can have many causes.

Lancet.oct 2016

Definition for the low back pain

- Pain located between the twelfth rib and the crease of the buttocks .
- LBP is a symptom associated with over 60 different medical conditions.
- Mechanical disorders of the low back affect the vast majority (often >95%) of individuals with this clinical symptom.

Nat Rev Rheumatol.2013 Nov;9(11):643-53

Clinical problem

- Approximately 200 treatment options are available to treat LBP.
- Furthermore, the etiology of back pain is often unclear.

JAMA April 11, 2017 Volume 317, Number 14

Clinical problem

- **Non EB management of LBP is associated with medical overuse and high health care expenditures.**
- **Clinical practice guidelines have the potential to reduce costs and encourage value-based medical care.**

JAMA August 22/29,2017 Volume 318,Number 8

Nonstandardized approach by physicians to clinical decision making

- Only 29% of physicians use any guideline to make the diagnosis of low back pain.
- It is unclear why physicians do not use guidelines to establish the diagnosis of low back pain.
- Possible reasons may include: low back pain is complicated by diverse multifactorial cause and presentation scenarios.
- There is a complex psychosocial overlay in low back pain.
- There is a diversity of outcomes.

Trajectories of low back pain

- Majority of back pain sufferers experience episodes of the problem.
- LBP is actually a recurrent condition .
- Thus, LBP resembles a long-term condition such as asthma .
- we need to look at LBP (and perhaps all types of spinal pain) as a lifelong process.

Low back pain (Recurrences)

- Recurrences are common, but most relapses are not disabling.
- A smaller subset of the population may be incapacitated from chronic LBP, defined as symptoms persistent for > 6 months.
- Furthermore, a small percentage of patients will develop persistent disabling LBP resulting in immense costs to society.

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Trigger of acute LBP

- Acute low back pain can be triggered by physical factors or psychosocial factors or by a combination of the two .
- **However, about a third of patients with an acute episode cannot recall a trigger.**
- New episodes are more likely to begin early in the morning.
- The weather does not affect low back pain.

Low back pain

(Epidemiology).

lifetime prevalence of 70% to 85%.

- LBP is the primary cause of disability in people < 50 years of age.
- LBP is second only to upper respiratory problems for physician visits each year.
- Despite its widespread prevalence, the general prognosis of acute LBP is favourable, as 90% of patients recover without sequelae.

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A systematic review of the global prevalence of LBP

- One-month prevalence 30.8%.
- LBP was more common in female than male individuals and in those aged 40–69 years than in other age groups.
- Prevalence was greater in high-income countries than middle-income or low-income countries.
- No difference in prevalence between rural and urban areas.

Arthritis Rheum 2012; 64: 2028–37.

The prevalence for back pain in children and adolescents

(An overview of systematic reviews)

- **Back pain prevalence is low in children but rises quickly during adolescence .**
- **Smoking and psychosocial factors are most consistently associated with back pain, but whether they are a cause or consequence is not certain.**

Childhood low back pain

- LBP was slightly more common in girls than boys (38.9% vs 35.0%).
- Prevalence increased with age, ranging from 27.4% in 11-y-olds, to 37.0% in 13-y-olds, to 46.7% in 15-y-olds.

Lancet.oct 2016

LBP in pregnancy

A prospective study of 325 pregnant women found that :

- **Almost two-thirds reported LBP, pelvic pain or both, during their current pregnancy.**
- **Similar proportions reported by a sample of pregnant women (N = 599) in the United States.**
- **Relapse rates are high in subsequent pregnancies and a postpartum prevalence of 24.7%.**

Epidemiology of back pain in older adults: prevalence and risk factors for back pain onset

- **The prevalence of disabling back pain increases with age in those aged >75 years.**
- **Older adults with poor self-rated health, depressive symptoms, and a previous episode of back pain are at greater risk of reporting future back pain onset.**

Rheumatology 2011;50:1645-1653

The global burden of LBP: estimates from the Global Burden of Disease 2010 study

- Out of all 291 conditions studied in the Global Burden of Disease 2010 Study, LBP ranked highest in terms of disability (YLDs), and sixth in terms of overall burden (DALYs).
- **LBP causes more global disability than any other condition.**
- With the ageing population, there is an urgent need for further research to better understand LBP .

Hoy D, et al. Ann Rheum Dis 2014;0:1–7.

low-back pain

(socioeconomic factors and consequences)

- The total costs of low-back pain in the United States exceed \$100 billion per year.
- Two-thirds of these costs are indirect, due to lost wages and reduced productivity.
- Indirect costs rely heavily on changes in work status.
- Total costs are difficult to calculate for many women and students as well as elderly and disabled patients.

J Bone Joint Surg Am.2006 Apr;88 Suppl 2:21-4.

Classification of LBP

(by Duration)

- **Acute: Lasts <4 weeks**
- **Subacute: Lasts 4–12 weeks**
- **Chronic: Lasts >12 weeks**

Annals of Internal Medicine, 3 June 2014

Classification of LBP (by clinician)

- The clinician should also attempt to place the patient's back pain into 1 of 3 categories:
- Nonspecific low back pain
- Back pain associated with radiculopathy or spinal stenosis
- Back pain associated with a specific spinal cause.

Non-specific low back pain

- A precise patho-anatomical diagnosis cannot be given in approximately 85% of LBP patients .
- It is resulting in the label “non-specific low back pain.”
- Imaging findings like lumbar osteoarthritis or (small) disc lesions often do not account for the symptoms experienced by LBP patients.

Pain Physician 2015; 18

Differential diagnosis of LBP

- Mechanical Low back pain
- Non mechanical spinal conditions
- Visceral disease

The most common cause is mechanical (97%).

N Engl J Med, Vol. 344, No. 5 February 1, 2001

Mechanical Low back pain

- **Lumbar strain, sprain (70%)**
- Degenerative processes of disks and facets, usually age-related (10%)
- Herniated disk (4%)
- Spinal stenosis (3%)
- Osteoporotic compression fracture (4%)
- Spondylolisthesis (2%)
- Traumatic fracture (<1%)
- Congenital disease (<1%) Severe kyphosis Severe scoliosis Transitional vertebrae
- Spondylolysis
- Internal disk disruption or diskogenic low back pain
Presumed instability

N Engl J Med, Vol. 344, No. 5 February 1, 2001

Lumbar strain, sprain

Strain

- Disruption of the muscle fibres at various locations within the muscle belly or musculotendinous junction.
- Patients experience intense pain for 24 to 48 hours then experience muscle spasm.

Sprain

- Sub catastrophic stretch of ≥ 1 spinal ligaments.
- Some fibres are injured but the overall continuity of the ligament is maintained.

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Non mechanical spinal conditions

Neoplasia (0.7%)

- Multiple myeloma
- Metastatic carcinoma
- Lymphoma and leukemia
- Spinal cord tumors
- Retroperitoneal tumors
- Primary vertebral tumors

Infection (0.01%)

- Osteomyelitis
- Septic diskitis
- Paraspinal abscess
- Epidural abscess Shingles

Inflammatory diseases (often associated with HLA-B27) (0.3%)

- Ankylosing spondylitis
- Psoriatic spondylitis Reiter's syndrome Inflammatory bowel disease
- Scheuermann's disease (osteochondrosis) Paget's disease of bone

Visceral disease

Disease of pelvic organs

- Prostatitis
- Endometriosis
- Chronic pelvic inflammatory disease

Renal disease

- Nephrolithiasis
- Pyelonephritis
- Perinephric abscess

Aortic aneurysm

Gastrointestinal disease

- Pancreatitis
- Cholecystitis
- Penetrating ulcer

Risk Factors for LBP

- Age
- Educational status
- Psychosocial factors
- Occupation
- Body mass index

Med Clin N Am 100 (2016) 169–181

Risk Factors for LBP

- **Age is one of the most common factors in the development of LBP.**
- **Highest incidence in the third decade of life and overall prevalence increasing until age 60 to 65 years.**
- **There is recent evidence that prevalence continues to increase with age with more severe forms of back pain.**

Med Clin N Am 100 (2016) 169–181

Risk Factors for LBP

- Lower educational levels are a strong predictor of more prolonged episode duration and poorer outcomes.
- Psychosocial factors such as stress, anxiety, depression, and certain types of pain behavior are associated with greater rates of low back pain.
- The presence of these conditions also increases the risk that a patient's episode of back pain will last long enough to be considered chronic.

Risk Factors for LBP

- Likewise, patients who are dissatisfied with their work situation are at risk of having an acute episode of back pain transition to a chronic situation.
- Occupational factors, specifically the physical demands of work, are also associated with an increased prevalence of low back pain.
- Matsui and colleagues found the point prevalence of low back pain to be 39% in manual workers, whereas it was found in only 18.3% of those with sedentary occupations.

Med Clin N Am 100 (2016) 169–181

Risk Factors for LBP

- **Bending, twisting, and whole-body vibration to be risk factors for low back pain.**
- **Obesity has been connected with an increased incidence of low back pain.**

Med Clin N Am 100 (2016) 169–181

Obesity as a Risk Factor for Sciatica (A Meta-Analysis)

- **26 studies (8 cross-sectional, 7 case-control, and 11 cohort) .**
- **This meta analysis showed that both overweight and obesity are risk factors for lumbar radicular pain and sciatica in men and women.**

Am J Epidemiol.2014 Apr 15;179(8):929-37.

The Association between Smoking and Low Back Pain: A Meta-analysis

- We conducted a systematic search of the MEDLINE and EMBASE databases until February 2009.
- Eighty-one studies were reviewed and 40 (27 cross-sectional and 13 cohort) studies were included in the meta-analyses.
- Our findings indicate that both current and former smokers have a higher prevalence and incidence of low back pain than never smokers, but the association is fairly modest.
- The association between current smoking and the incidence of low back pain is stronger in adolescents than in adults.

The American Journal of Medicine (2010) 123, 87.e7-87.e35

The Effect of Smoking on the Risk of Sciatica: A Meta-analysis

- Comprehensive literature searches were conducted in PubMed, Embase, Web of Science, Scopus, Google Scholar, and ResearchGate databases from 1964 through March 2015
- The associations did not differ between men and women, and they were independent of study design.
- **Smoking is a modest risk factor for lumbar radicular pain and clinically verified sciatica.**
- Smoking cessation appears to reduce, but not entirely eliminate, the excess risk.

The American Journal of Medicine (2016) 129, 64-73

Lifestyle Risk Factors Increase the Risk of Hospitalization for Sciatica: Findings of Four Prospective Cohort Studies

- **Smoking and obesity increase the risk of hospitalization for sciatica.**
- **Walking or cycling to work protects against hospitalization for sciatica.**
- **Walking and cycling can be recommended for the prevention of sciatica in the general population.**

The American Journal of Medicine (2017)

Relationships Between Weight, Physical Activity, and Back Pain in Young Adult Women

- Higher weight, inadequate levels of physical activity, and depression were all independent predictors of back pain over the following decade.
- Furthermore, the adverse effects of weight on back pain were not mitigated by physical activity.
- Our findings highlight the role of both higher weight and physical inactivity in back pain among young women and suggest potential opportunities for future prevention.

Medicine (Baltimore). 2016 May; 95(19): e3368

Genetic influence

- Recent literature points to the fact that genetic influences are more important than the mechanical effects .
- A UK-based study of twins found the odds of the other twin also having clinically significant disc degeneration was higher in monozygotic twins (OR 6) than dizygotic (OR 2.2).
- Genes that are implicated with disc degeneration include the genes that code for collagen I, IX, XI, interleukin 1, aggrecan, vitamin D receptor, MMP-3, and CILP (cartilage intermediate layer protein).

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Assessment of psychosocial factors

psychosocial factors:

- Such as depression, unemployment, job dissatisfaction, somatization disorder, or psychological distress.
- These factors identifies patients who may have delayed recovery and could help target interventions.

Supervised exercise therapy, cognitive behavioral therapy, or intensive multidisciplinary rehabilitation.

Annals of Internal Medicine 3 June 2014

Relationship of depression in participants with nonspecific acute or subacute LBP and no-pain by age distribution

- The aim of this study was to determine the Beck Depression Inventory (BDI) scores in participants with nonspecific LBP and no-pain by age distribution.
- **Participants with nonspecific acute and subacute LBP present higher BDI depression scores, influenced by age distribution.**
- Specifically, patients in the age range from 40 to 80 years with LBP could require more psychological care in addition to any medical or physical therapy.
- Nevertheless, physical factors, different outcomes, and larger sample size should be considered in future studies.

Interplay among pain intensity, sleep disturbance and emotion in patients with non-specific LBP

- **NSLBP leads to sleep disorders, which decrease the sleep quality and increase the unpleasant emotions and memories in return.**
- **These can exacerbate the severity of LBP, with the cycle repeating to form a vicious circle.**

PeerJ. 2017; 5: e3282.

Red flags

- **There are limited data to support the use of most of the red flags as an indication for early imaging .**
- Systematic reviews of studies found that only a history of cancer has been shown to increase the probability of finding spinal malignancy.
- Systematic reviews have found that the red flags associated with the highest post-test probability of a vertebral fracture were:

Older age, prolonged use of corticosteroids, severe trauma.

Uptodate 2017

Conclusion

- Low back pain is a symptom rather than a disease.
- LBP causes more global disability than any other condition.
- lifetime prevalence of LBP is 70% to 85%.
- A precise patho-anatomical diagnosis cannot be given in approximately 85% of LBP patients .

The most helpful components for predicting persistent disabling low back pain were:

- Maladaptive pain coping behaviors, nonorganic signs, functional impairment, and presence of psychiatric comorbidities.



Thanks for your attention