Musculoskeletal Diseases in Agriculture

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Disclosures

- None
Objectives

• Describe common musculoskeletal problems associated with agriculture, and their causes.

• Describe the anatomical causes of agriculturally related musculoskeletal problems, “danger signs”, and appropriate screening examinations.

• Discuss treatment options for a variety of musculoskeletal problems in agriculture.
Introduction

• Agriculture employs about ½ of the world’s entire workforce

• Musculoskeletal injuries are the most common of all occupational injuries for farm workers, especially those involved in labor-intensive practices (Fathallah, 2010; Grisso, 2020)
  • Lifting and carrying heavy loads (over 50#)
  • Sustained full body bending (stoop)
  • Highly repetitive hand work
Introduction

- Musculoskeletal injuries include diseases of the:
  - Bone
  - Joints and supporting structures
  - Nerves

- Common disorders include:
  - Fractures and dislocations
  - Sprains and strains
  - Tendonitis and tenosynovitis
  - Enthesistis and bursitis
  - Arthritis of all types to include traumatic, reactive, infectious, and osteoarthritis
Introduction

- Musculoskeletal injuries are characterized by:
  - Pain and tenderness
    - nociceptive, neurological, and psychological issues all apply
  - Stiffness
  - Edema
Introduction

• Determining cause and effect of often difficult for both the patient and the health care provider.
  • This often becomes important for worker’s compensation claims.

• It is important to keep in mind the frequency of the problem in non-agriculture workers, along with potential confounding factors.
  • Age, race, obesity

Varghese, et.al. 2022
Neck pain is second to only to LBP as the most common musculoskeletal disorder and is often reported among workers.
Neck

- Cervical Degenerative Disk Disease
  - May be subclinical
  - Can affect nerve roots
  - X-rays may not correlate with symptoms
  - In farmers neck pain can be aggravated by driving tractors and looking to the rear
  - Only in severe cases will there be reflex changes
Neck
Neck

- Warning signs
  - Weight loss, fever, IV drug use
  - Pain that wakes a patient at night
  - Recent infection
  - In cases of trauma, concern for fracture
Neck

- Standard films are indicated for patients with chronic pain or in those with warning signs.
- Early treatment with PT is important
  - Traction, heat, ultrasound
  - NSAID’s
  - Steroids, muscle relaxants, etc. are usually not needed for acute syndromes
Lower Back

- The annual incidence of low back pain episodes is approximately 50%
  - More than 10% seek medical attention
- Most patients recover without treatment
- Risk factors
  - Heavy lifting, bending and lifting, vibration, and prolonged sitting in a fixed position (farming)
Lower Back

- Many farmers do not seek medical attention
- Degenerative disk disease
  - Part of the aging process
  - Come to the attention of the medical community because of the activities noted
  - Like with the neck, x-rays may not correlate with symptoms
Lower Back

- Degenerative disk disease
  - May be accompanied by sciatica symptoms
  - Almost half of the population have DDD on MRI
    - 1/3 of individuals may not have symptoms
  - Etiology is unclear but appears to have a hereditary component
Lower Back

- Degenerative disk disease
  - Sciatica, weakness, and numbness are caused by pressure on exiting nerves
  - The onset of symptoms may be gradual or sudden
  - Location of pain in the leg may help locate the point of nerve impingement
Lower Back

Dermatomes

(area of skin innervated by the cutaneous branches from a single spinal nerve is called a dermatome)

Reveal sites of damage to spinal nerves or spinal cord
Lower Back

- There are other causes of LBP:
  - Referred pain from the abdomen and pelvis
  - Warning sign for more severe problems may include fever, diarrhea, bloody urine, painful urination, nighttime pain, weight loss

- Other diagnosis may include spinal stenosis, spondylosis, ankylosing spondylitis, and coccygodynia
Lower Back

- Treatment is similar to neck pain and is tailored to the diagnosis
  - Physical therapy
  - NSAID’s
  - Muscle relaxants
  - Exercise
Shoulder

- The shoulder is a very movable joint and is important in most daily activities
- Made up of several joints
  - Glenohumoral
  - Acromioclavicular
- Very common injury as it relate to occupational injuries

spectrumwellness.com
Shoulder

- Farming puts many stressors on the shoulder
  - Lifting, pulling, vibratory and repetitive activities

- Because of the stress placed on the joint there may be a higher incidence of OA of the true shoulder joint
Shoulder

- Impingement
  - Related to tendonitis
  - May be related to overuse
  - Often involves the tendons of the rotator cuff (SITS)

Timberlanept.com
Shoulder

Shoulder pain:
- Shoulder pain between 40° and 120° indicates subacromial or rotator cuff disorder.
- Positive test result: patient experiences either pain or weakness during the maneuver.
- Positive test result: immediate drop of the arm accompanied by pain.

Tests:
- Pain provocation test: patient's shoulder is fully abducted.
- Strength tests:
  - Internal rotation lag test (subscapularis muscle):
    - Patient's arm is lifted off of bed by examiner, and patient is asked to maintain position.
    - Positive test result: patient is unable to maintain the position.
  - External rotation lag test (supraspinatus and infraspinatus muscles):
    - Patient's arm is passively rotated, and patient is unable to maintain a position of full external rotation.
    - Positive test result: patient experiences pain or weakness during the maneuver.

Muscles of the Rotator Cuff:
- Subscapularis
- Supraspinatus
- Infraspinatus
- Teres Minor

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Shoulder

- Adhesive capsulitis
  - Also called frozen shoulder
  - May be related to diabetes
  - Treated with aggressive PT
  - Often self limited but can be very disabling
Elbow and Hands

- Epicondylitis
  - Can be either medial (golfers) or lateral (tennis) in location
  - Results from inflammation of the insertion of tendons from the hands around the elbow
  - Tennis elbow is much more common
  - Related to repetitive activity

Chiroeco.com
Elbow and Hands

- Epicondylitis
  - Pain can be localized or can radiate
  - Symptoms are worse with activity
  - Treatment is rest, PT, and splints
  - Injections are to be used judiciously
Elbow and Hands

- **De Quervain’s Tenosynovitis**
  - Tendonitis of the tendons of the wrist and thumb
  - Related to overuse
  - Treated with rest, NSAID’s, and splint
  - May require infection
  - DDX: intersection syndrome

- **Trigger finger**
  - Related to tendonitis of the finger and associated with nodule formation
  - Treated with rest, NSAID’s and often injection
Elbow and Hands

- Carpal tunnel syndrome
  - Common disorder associated with hand pain
  - Nerve compression as the median nerve passes through the carpal tunnel
Elbow and Hands

• Carpal tunnel syndrome
  • Has been associated with overuse
    • Also associated with pregnancy, thyroid disease, and inflammatory arthritis such as rheumatoid arthritis
  • In farming may be related to activities that involve vibration, milking, and being female
• Symptoms of pain and paresthesia of the hand
Elbow and Hands

- Carpal tunnel syndrome
  - Symptoms classically involve 2 ½ fingers and is worse at night
  - Shaking the hand may relieve symptoms
- Testing and diagnosis
  - Phalen and Tinel’s signs
  - Look for signs of motor involvement
  - EMG/NCV
Elbow and Hands

- Carpal tunnel syndrome
  - Treatment include rest, NSAID’s, splints, injection and/or surgery
Ergonomics

- Farmers have been historically self reliant and will change practices out of necessity
  - Tractors
    - Increased morbidity and mortality issue
    - Issue associated with roll over accidents
- Many tools have been developed to reduce bending and repetitive activities
  - Powered shears
Ergonomics

• Efforts have been made to reduce stooping and awkward body positioning
  • Prone workstations in fields
  • Picking platforms

• Efforts are still being made to push effective ergonomic interventions
  • Costs are a major concern
Conclusion

- Recognize agriculture related musculoskeletal problems and there diagnosis and treatment.
- Identify warning signs for further evaluation
- Be aware of ergonomic research and how it may affect future farming practices
References and Suggested Reading


