IRISH STRENGTH & CONDITIONING NETWORK
Research Review

Title

A Biomechanical Comparison Between Conventional, Sumo, and Hex-Bar Deadlifts Among Resistance Trained Women

Source

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Purpose of Study

To compare kinematics, net joint moments (NJMs), and surface electromyography (sEMG) amplitude between conventional, sumo, and hex-bar deadlifts during the last repetition of a 3 repetition maximum (3RM) in strength trained women.

Key Findings

1. **Hip NJMs**:
   - Conventional and sumo deadlifts resulted in larger hip NJMs near the lockout phase.
   - Hex-bar deadlifts showed lower hip NJMs but greater barbell velocity and knee NJMs.
2. **Knee NJMs and Flexion Angles**:
   - Hex-bar deadlifts resulted in greater knee NJMs and increased hip and knee flexion angles.
   - Sumo deadlifts required less vertical barbell displacement, reducing mechanical work by 25-30%.
3. **Barbell Velocity**:
   - Hex-bar deadlifts achieved higher barbell velocities compared to conventional and sumo deadlifts.
4. **sEMG Amplitude**:
   - Higher sEMG amplitude for the vastus lateralis in hex-bar deadlifts.
   - Sumo deadlifts showed higher sEMG amplitude for the gluteus medius, gluteus maximus, and semitendinosus compared to hex-bar deadlifts.

Practical Applications

- **Hex-Bar Deadlifts**: Beneficial for targeting knee extensors and enhancing barbell velocity.
- **Conventional and Sumo Deadlifts**: More effective for targeting hip extensors near the lockout phase.

Research Methods

The study used statistical parametric mapping to compare kinematics, NJMs, and sEMG amplitude among 11 strength trained women performing 3RM deadlifts in conventional, sumo, and hex-bar variations.

Strengths and Limitations

Strengths:

- Comprehensive comparison of deadlift techniques in strength trained women.

- Highlights practical applications for strength and conditioning practitioners.

Limitations:

- Small sample size.
- Findings may not fully generalize to all populations due to standardized stance widths and lack of knee extension requirement during lockout.

Takeaway Message

Hex-bar deadlifts are advantageous for developing knee extensor strength and achieving higher barbell velocities, while conventional and sumo deadlifts are more suitable for targeting hip extensors during the lockout phase. Strength and conditioning practitioners can use these insights to tailor training programs for strength trained women.
