Biomechanical studies focusing on the lifting of long awkward heavy objects are uncommon. In-The-Hole (ITH) drilling is a heavy, repetitive mining task with a high incidence of low-back injuries.

**INTRODUCTION**

In agreement with Gagnon (2005), some experienced handlers’ strategies may present a potential for safety (reduction of back loading) and deserve further attention.

**RESULTS**

It was found that group A compared to group B had significantly (P < 0.05):

- lower peak resultant moment (Nm) 169 ± 35 vs 265 ± 50
- less vertical work of the rod (Joules) 82 ± 40 vs 124 ± 39
- less trunk flexion during lifting (degrees) 41 ± 7 vs 50 ± 8
- less vertical velocity of the rod (m/s) 0.47 ± 0.19 vs 0.69 ± 0.18

Moreover, video observation revealed that handlers in group A compared to group B:

- Grabbed the rod higher with the upper hand above the center of mass of the rod.
- Lifted the rod with the lower hand in pronation instead of supination (Figure 1 and 2).
- Had a smaller distance between the hands.
- Used the upper arm as the fulcrum and the lower hand as the force to pivot, rather than truly lifting the rod.
- Minimized the downward motion of the rod just before the lifting.

**DISCUSSION**

- This study showed that the lifting strategy may contribute to reduce low-back loadings by 36%.
- The vertical distance traveled during lifting was, on average, 10 cm smaller in group A than in group B. A typical drill string includes 40 rods. Therefore, after 40 rods, group A would have saved, on average, four meters in vertical distance and consequently in effort.
- Literature supports the finding that a lifting strategy favouring a smaller vertical distance (vertical work) with less trunk flexion and less vertical velocity of the load decreases the low back loading.
- Although the number of subjects is a major limitation in this study, it is important to recognize that some workers have handling strategies that could help to decrease back loading while reducing energy cost, which may prove to be important for protecting the back.

**CONCLUSION**

In agreement with Gagnon (2005), some experienced handlers’ strategies may present a potential for safety (reduction of back loading) and deserve further attention.

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**REFERENCES**
