PREDIS study
PREdiction of DIFFicult Spinal

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BACKGROUND

Worldwide, 230 million surgical procedures are performed every year

- some surgical procedures are not feasible with spinal anesthesia (e.g. head and neck surgery),
- but other surgical procedures (e.g. THR or TKA) are mostly conducted using spinal anesthesia.

Spinal anesthesia is likely to reduce mortality and serious postoperative complications.

Potential benefits are counterbalanced by specific complications

- major neurologic complications (i.e. permanent neurological injuries): 0.04% to 0.004%,
- neuropathies (i.e. any neurologic complication related to the spinal anesthesia) : 3%

Both are associated to technical difficulties during spinal.

Preoperative medical history can help to predict postoperative complications,

- But predictors of postoperative complications (e.g. ASA physical status) are only poorly associated to difficult spinal
- Balance between benefits and risks of spinal anesthesia cannot be resumed by preoperative medical histories

We need a specific evaluation of the risk of difficult spinal.

When spinal anesthesia is definitely the best strategy according to patients’ medical histories (e.g. severe COPD), patients with predicted difficult spinal may benefit from advanced methods (e.g. echo guided spinal anesthesia)
Main objective:  
to evaluate a simple preoperative anatomical scale based on patient’s back inspection, to provide robust estimation of the risk of difficult spinal, and to determine if other predictors can improve the predictive performance of this simple anatomical scale.

Secondary objectives:  
• Determine the rate of complications related to spinal anesthesia.  
• Determine the predictors of the complications related to spinal anesthesia.  
• Determine patients’ satisfaction.  
• Determine inter-observer reproducibility of PREDIS.  
• Define a multivariable predictive score for difficult spinal including PREDIS and other potential preoperative predictors.
Any patients undergoing elective or emergency procedures requiring a neuroaxial procedure (spinal or lumbar epidural) at HHS.
Prediction of Difficult Spinal (PREDIS) scale

Determined preoperatively on a patient sit up straight, head flexed:

- **Class I**: Lumbar spinous processes can be seen.

- **Class II**: Lumbar spinous processes can be easily found with palpation.

- **Class III**: Lumbar spinous processes cannot be easily found with palpation, but median structures are palpable.

- **Class IV**: Lumbar spinous processes cannot be find during palpation, median structures cannot be determined.
Difficult spinal (DIS) is the study primary outcome.

DIS will be defined as:

• More than two (2) attempts. Each new skin puncture will be considered another attempt. However, redirecting the needle without a new skin puncture will be not considered as an additional attempt.

• Procedure time longer than 10 minutes from the first attempt to the cerebro-spinal fluid (CSF) confirmation.
Patient’s satisfaction will be evaluated using a visual scale ranging from 0 to 10. 0 will represent the lowest degree of satisfaction and 10 the highest.

Failed spinal anesthesia will be defined by the need of a general anesthesia related to analgesia concerns before the end of the surgical procedure. The surgery length will be recorded at the same time.

Neurologic complications: will be separate as permanent or not. Any complementary examination or assessment related to such postoperative complication will be recorded.
Patients information:
• To provide a fair evaluation of the risk of DIS during preoperative evaluation.

Benefit/Risk evaluation:
• Reproducible evaluation of the risk of DIS
• Integration of the risk of DIS in the determination of the anesthesia plan.

Stratification:
• Mandatory for trials aiming to determine the interest of new techniques (e.g. echo)

Survey:
• Provide data about complications associated with our actual practice of spinal anesthesia at HHS.