

DEPITAC*Study : Interest of a New Early Screening Tool for Posttraumatic Stress Disorder in the year after a Motor Vehicle Accident

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INTRODUCTION

Post-Traumatic Stress Disorder (PTSD) is one of the most common psychological consequences for adult Motor Vehicle Accident (MVA) survivors. It can have serious and long-lasting consequences for recovery if left untreated. Prevalence rates of PTSD after a MVA vary from 6 to 45% across 35 recent studies (Heron-Delaney and al., 2013).

Because of the difficulties to predict who is going to develop a PTSD, we aim to create an **early screening tool used by nurses**, able to determine people at high risk of PTSD in the year after a MVA.

MATERIAL AND METHODS

This multicentric longitudinal study, approved by an independent ethics committee (CPP 06/91), assessed **274 patients**. Stemming from literature and clinical knowledge, DEPITAC is a 10 questions form submitted by trauma unit nurses to hospitalized patients in the 14 days following their MVA. People under 18, homeless, presented with brain injury, collapsed more than 15 minutes or under guardianship couldn't be included in this study. Post-traumatic Stress Disorder Checklist Scale (PCL-S) was performed at 8 weeks, 6 months and 1 year after the MVA to diagnose PTSD. Peritraumatic Distress Inventory (PDI) was used as a reference and fulfilled at the same time as DEPITAC in the Trauma Units participating to this research.

Correlation between PDI and DEPITAC score was assessed using the Spearman coefficient correlation. Comparisons between centers on DEPITAC score were performed using a Kruskal-Wallis test.

All items of DEPITAC score were included in a backward stepwise logistic regression analysis with value of $P < 0.20$ used as the cut-off for retention in the model. Discrimination of the final model was evaluated using the area under the ROC curve and compared to the full model (including all items of DEPITAC score) using the nonparametric approach of DeLong. A further backward stepwise logistic regression analysis was performed by including the items of DEPITAC score selected by the previous multivariate analysis and potential confounding factors.

The calibration of the model was checked using the Hosmer and Lemeshow test and we determine optimal threshold value by maximizing the Youden index. Statistical testing was done at the two-tailed α level of 0.05. Data were analyzed using the SAS software package, release 9.4 (SAS Institute, Cary, NC).

Timeline: MVA (0) → Max 14 days after RTA (DEPITAC, PDI) → 8 WEEKS (PCLs) → 6 MONTHS (PCLs) → 12 MONTHS (PCLs)

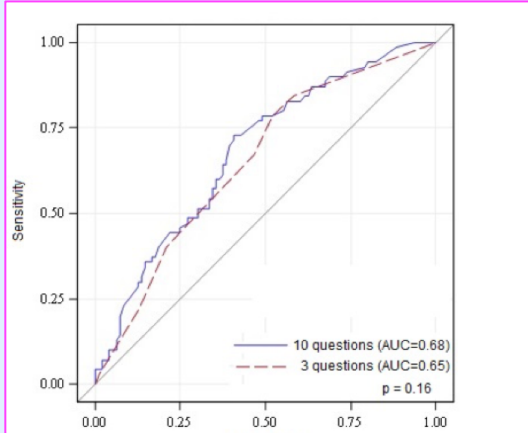


Fig1: ROC graphs and comparative test

	Odds-ratio	95%CI	P	Points
DEPQ6	2.77	1.35 ; 5.67	0.0055	1
DEPQ7	2.36	1.12 ; 5.01	0.0249	1
Gender (Girls vs Boys)	2.15	1.01 ; 4.55	0.0463	1
Children (No vs Yes)	2.52	1.22 ; 5.18	0.0121	1
Trauma score			0.0844	
≤ 4	1.00	Ref.		0
4-8	3.01	1.15 ; 7.90		1
> 8	2.38	0.98 ; 5.79		2

Fig. 2: Final Screening Tool (AUC = 0,74)

RESULTS

- DEPITAC and PDI are correlated ($p < 0,001$) but show a low redundancy ($r=0,315$). DEPITAC is generalizable (no center effect; $p > 0,05$).
- The complete form DEPITAC can be simplified to 3 significant questions : **Q3** (there were other people injured or killed in the accident), **Q6** (dissociation: detachment / estrangement from others or amnesia of all or part of the accident) and **Q7** (the person experienced threatened death of self) (cf. Figure 1).
- Among predictors of later PTSD from literature, only 6 were selected ($p < 0,20$) : **gender** ($p=0,0106$), **to have a child** ($p=0,0175$), **vehicle type** ($p=0,0103$), **to have a MVA in the past** ($p=0,1163$), **to have taken alcohol during the MVA** ($p=0,0873$) and **the trauma score** ($p=0,0052$).

The final screening tool obtained by mixing C3, C6, C7 and those items is summarized in **Figure 2**. C3 isn't relevant anymore because it seems to be redundant.

The **AUC of the final model is 0.75** [95%CI, 0.67-0.82] and the Hosmer and Lemeshow test isn't significant (0.54), indicating a **good calibration**. A simple risk score is presented in Figure 2.

The higher the score is, the higher the risk of PTSD is (**OR, 1.96; 95%CI, 1.46-2.62**).

We determine an **optimal threshold value of 3 points** with a **sensibility of 0.80** [95%CI, 0.70-0.90] and a **specificity of 0.59** [95%CI, 0.49-0.69].

CONCLUSIONS AND PERSPECTIVES

This purged form of DEPITAC is easier for nurses daily use and reveals a strong discriminating power (AUC=0,74) to predict people who will develop a PTSD in the year following a MVA.

Each item presents a high odd ratio. **Presence of a dissociation (Q6) or perception of a vital threat (Q7) can each multiply the risk by 2 to develop PTSD in the year post MVA**, as a contrary the presence of a child divides the risk by 2.

Presence of one of those items allows nurses to alert prematurely the psychiatric teams to dispense quickly the adequate cares.

A future work will be processed to determine the cut-off of this new scale and a dimensional approach is currently assessed to describe the clinical patients profiles from these criteria