

Specificity and sensitivity of Tetanos Quick Stick: prospective evaluation, Port-au-Prince, Haiti

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Introduction - Objectives

Martissant 25 emergency centre in Haiti in 2019

- 7,298 dressings and/or stitches
- Up to 6,400 patients with tetanus-prone wounds: all received tetanus immunoglobulin (TIG)

Need to reduce unnecessary injections of TIG

→ Use of rapid test (TQS) at bedside to assess protection against tetanus

Methods

Eligibility criteria: aged ≥ 2 years + tetanus-prone wound + able to give consent

Specificity (Sp) of TQS: probability of the TQS to be negative in patients not protected according to the ELISA test

Sensitivity (Se) of TQS: probability of the TQS to be positive in patients protected according to the ELISA test

Study design: figure 1

Results

- 264 patients included: 68% men and 80% adults
- Tetanus seroprevalence (ELISA result, cut-off 0.51 IU/mL): 64.4%
- 5.3% of unprotected patients classified as protected by TQS (table 1) – 2.1% if short-term protection
- Women more protected than men (table 2)
- Protection decreases with age (table 2): < 25 years old better protected

Table 1. Evaluation of the TQS compared to the ELISA.

ELISA cut-off	<0.51 IU/mL (negative)	≥0.51 IU/mL (positive)	<0.11 IU/mL (negative)	≥0.11 IU/mL (positive)
TQS negative	89	15	46	58
TQS positive	5	155	1	159
Se, % (95% CI)	91.2 (85.9 – 95.0)		73.3 (66.9 – 79.0)	
Sp, % (95% CI)	94.7 (88.0 – 98.3)		97.9 (88.7 – 99.9)	

Limitations

No stratification per age and gender

Limited number of children

Not all staff members participated: feasibility and acceptability?



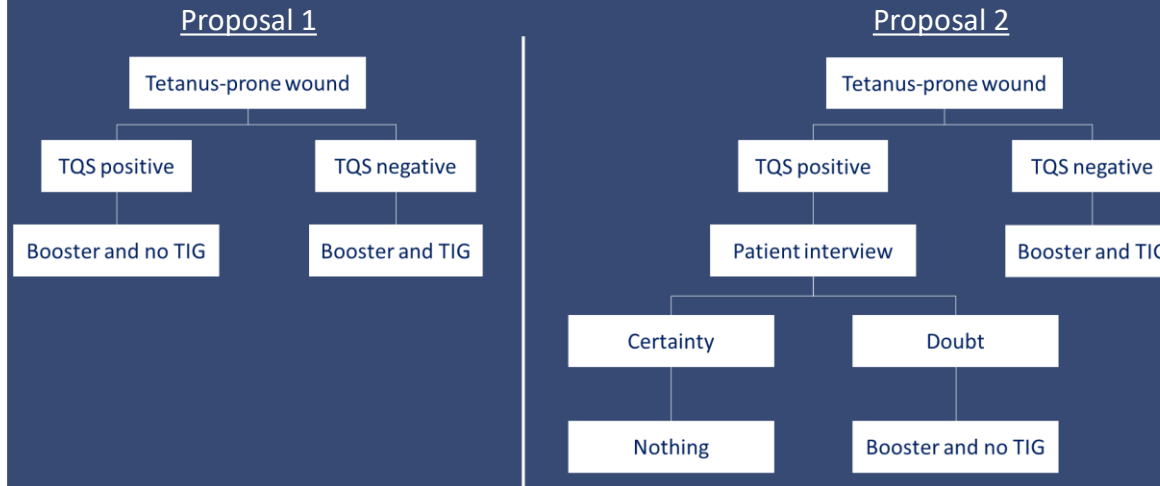
- High specificity of TQS compared to ELISA: specificity increases if short-term protection considered

- With TQS in study population:

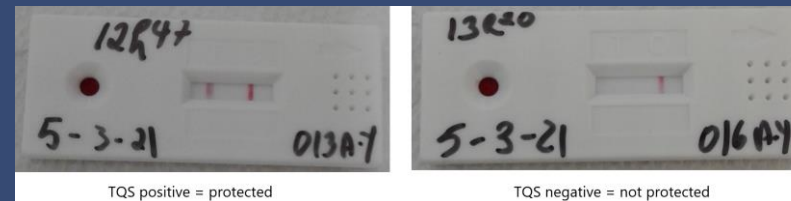
- ✓ 60.6% reduction of TIG injections if TIG given to TQS negative patients only

- ✓ Unnecessary injections given to 8.8% of protected patients (15 TQS negative / 170 ELISA protected patients)

- Proposed schemes of care of tetanus-prone wounds, using TQS:



Examples of TQS result



TQS positive = protected

TQS negative = not protected

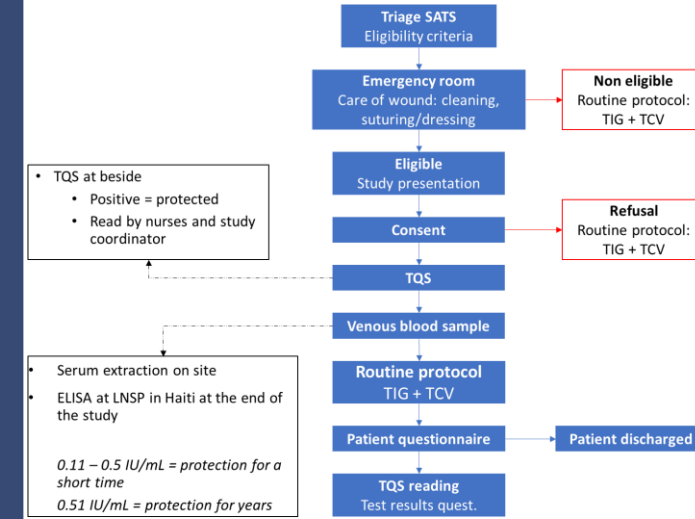


Figure 1. Study design.

TCV = tetanus containing vaccine, LNSP = Laboratoire National de Santé Publique.

Table 2. Factors associated with a tetanus protection (ELISA cut-off 0.51 IU/mL).

	OR	95% CI	p-value	Adjusted OR*	95%CI*	p-value*
Gender						
Men	-	-	-	-	-	-
Women	3.25	1.75 – 6.04	<0.001	3.60	1.90 – 6.82	<0.001
Age	0.97	0.95 – 0.98	0.001	0.96	0.94 – 0.98	<0.001
Education						
≤ Primary school	-	-	-	-	-	-
Secondary school	1.27	0.72 – 2.24	0.417	-	-	-
Vocational education	0.73	0.33 – 1.60	0.428	-	-	-
Higher education/University	1.43	0.34 – 5.90	0.624	-	-	-
Region of birth						
Nord	-	-	-	-	-	-
Ouest	1.39	0.54 – 3.57	0.488	-	-	-
Sud	0.70	0.27 – 1.81	0.461	-	-	-
SATS level						
Yellow	-	-	-	-	-	-
Orange + Red	0.62	0.35 – 1.10	0.104	-	-	-

*Only variables with p<0.20 in univariate analysis used in multivariate analysis; SATS level not significant in multivariate analysis.

Conclusion

Considering Haitian tetanus incidence (2.41/100,000 in 2019), the use of TQS could help reduce unnecessary injections of TIG with a marginal increase in risk of tetanus.

We suggest using TIG only for patients with a tetanus-prone wound and a negative TQS.

Acknowledgements

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The study was approved by the MSF ERB and the Comité National de Bioéthique de Haïti (National Bioethics Committee of Haiti), ref. 1921-5.

