Availability and Use of Resources for Emergency Fracture Care of Pelvic Trauma Associated with Hemorrhagic Shock in Latin America: A Cross-Sectional Study

Jorge E. Velarde Jr., MD*; Vincenzo Giordano, MD, PhD;*
Marco Antonio Altamirano-Cruz, MD; Carlos Oliver Valderrama-Molina, MD, MSc;
Matheus Azi, MD, PhD; William Dias Belangero, MD, PhD; Fernando Bidolegui, MD;
Guido Sebastián Sebastian Carabelli, MD; Amparo Gómez, MD, MSc;
Robinson Esteves Pires, MD, PhD; José Arturo Xicará, MD, MSc

Purpose: Determining the true availability of resources and understanding the level of training of surgeons involved in the treatment of patients with pelvic fractures and hemorrhagic shock is critical. In this study, the availability of technical, technological, and human resources for the care of this injury in Latin America region was analyzed, and the preferences of orthopaedic trauma surgeons when performing interventions for the diagnosis and treatment of patients with pelvic trauma and associated hemorrhagic shock was described.

Methods: A cross-sectional web-based survey containing questions on knowledge, attitudes, and practices with respect to imaging resources, emergency pelvic stabilization methods, and interventions used for bleeding control was sent to 948 Latin America orthopaedic trauma surgeons treating pelvic fractures in the emergency department. Differences between regional clusters, level of training, type of hospital, and pelvic surgery volume were assessed.

Results: 368 responses were obtained, with 37.5% of respondents reporting formal training in pelvic surgery and 36.0% having available protocol for managing these patients. The most frequently used interventions were the supra-acetabular pelvic external fixator and pelvic packing. Limited hospital and imaging resources are available for the care of patients with pelvic trauma and associated hemorrhagic shock throughout Latin America. In addition, the training of orthopaedic trauma surgeons dealing with this type of injury and the volume of pelvic surgeries per year is heterogeneous.

Conclusion: It should be urgently considered to develop management protocols adapted to Latin America according to the availability of resources, as well as to promote training in this severe life-threatening traumatic condition.

Table 2. Difference in resources and interventions according to the Latin American region and the type of hospital.

Variable	All sample	AO Latin America Cluster				Types of Hospital			
		North	Central	South	East	Public	Private	University	Non university
Hospital Resources									
Surgery time available (24 hr)	93.3%	91.2%	93.9%	96.6%	87%	91%	96%	91%	96%
Intensive care available	95.5%	92%	97%	98%	96%	97%	93%	98% (*)	93%
Blood bank available	91.3%	94%	84% (*)	98	96	96%	79% (*)	95% (*)	85%
Management protocol established	36.1%	35%	30%	45%	39%	37%	38%	41%	33%
Surgery 24hrs / Blood bank / ICU	80.1%	81%	77%	92%	83%	86% (*)	73%	86% (*)	77%
Imaging Resources									
FAST	71.5%	76%	67%	74%	67%	75%	64% (*)	74%	68%
Emergency room X-rays	78%	84%	69% (*)	82	82%	77%	81%	76%	82%
CT Scan	88%	87%	81% (*)	97%	97%	86%	89%	90%	83%
IR (or similar)	48%	42%	47%	63% (*)	36%	43% (*)	63%	55%	42% (*)
FAST / X-rays / CT Scan	52%	57%	41% (*)	60%	58%	54.5%	48.6%	54%	51%
Human Resources									
General Surgeon available 24hr	85%	88%	85%	86%	79%	91% (*)	72%	91% (*)	76%
Orthopaedic surgeon available 24 hr	77%	78%	68%	87% (*)	79%	83% (*)	63%	82% (*)	70%
IR 24 hrs / Partial time	48%	42%	47%	63% (*)	36%	43% (*)	63%	55%	42% (*)
General Surgeon / Orthopaedic Surgeon / IR	45%	38%	42%	62% (*)	36%	39%	59% (*)	51% (*)	39%
Interventions									
Transfusion in the Emergency Room	95%	96%	93%	98%	91%	97% (*)	91%	96%	94%
Non-Invasive External Fixation in Emergency Room	91%	88%	88%	99% (*)	91%	91%	91%	89%	93%
Invasive External Fixation in Emergency Room	27%	38%	16% (*)	30%	24%	35% (*)	15%	28%	28%
C-Clamp Availability	14%	10%	19%	12%	9%	16&	14%	9%	20% (*)
Supracetabular External Fixator	58%	45%	62%	81%	24% (*)	59%	61%	64%	53%
Arteriography Embolization	27%	16% (*)	26%	43%	33%	18%	44% (*)	30%	22%
Pelvic packing	66%	63%	66%	72%	64%	63%	68%	64%	64%
REBOA	4.6%	3%	5%	4.5%	9%	4%	6.5%	6.5%	2.8%
Antishock Screw	34%	26%	36%	36%	49%	32%	39%	38%	30%

Source: Grupo de Apoyo a la Investigación – AO Trauma Latin America, 2023.

Legends: ICU: Intensive Care Unit; FAST: Focused Assessment with Sonography in Trauma; CT: Computed Tomography; IR: Interventional Radiology; REBOA: Resuscitative Endovascular Balloon Occlusion of the Aorta.

(*) $p \leq 0,05$ ($\chi 2$)