Rethinking surgical care in conflict

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The provision of surgical assistance in conflict is often associated with care for victims of violence. Images of the war wounded from bullets, bomb-blasts, and other violent assaults often feature prominently in the mass media. The discipline has been guided by military surgeons from the developed world who aim to develop approaches that use the latest surgical technologies in war zones.[1,2] However, in many conflicts, the bulk of surgical care is provided by non-military actors, including humanitarian organisations, who work with more limited resources.[3]

Injury during conflict contributes to substantial mortality, but major causes of excess mortality are often secondary: cholera, measles, and malnutrition are all exacerbated by mass population-displacements and overcrowded conditions for refugees.[4,5] Similarly, surgical needs in conflict extend well beyond trauma: mortality from infection, poor nutrition, obstetric emergencies, and accidental injuries are all amenable to surgical intervention. A recent study from the Democratic Republic of Congo found that mortality from obstetric emergencies and accidental injury in conflict was four times higher than that from violence.[5] In general, maternal and child mortality is higher in conflict-affected and post-conflict countries than in least-developed countries not directly affected by conflict.[6]

Surgical projects in conflicts rarely collect reliable statistics, but operational data suggests that civilian surgical needs are predominantly not related to combat. A retrospective review of surgical services of Médecins Sans Frontières in six conflict settings found that only 22% (1050) of 4630 surgical interventions were due to violent injury. Violence represented less than half of all surgical interventions in conflict-affected areas in Pakistan (5%), South Sudan (21%), Chad (36%), and Somalia (41%). At almost all sites, obstetric emergencies vastly outnumbered the war-wounded, accounting for almost a third (30%) of all interventions, while accidental injury and tropical infections accounted for another third.

The fact that war-wounded often represent a minority of surgical needs is not sufficiently appreciated. A seven-country review of health services for displaced populations found that not a single camp had an operating theatre that could provide life-saving surgery, such as caesarean section or bowel-rupture repair.[7] Other likely needs include

an increase in complications of untreated infectious diseases, such as bowel perforation from typhoid fever and soft-tissue abscesses. Limiting surgical humanitarian assistance to the war-wounded will lead to partial needs-assessments, and inadequate programme-planning and provision of supplies and human resources.

Part of the problem is a lack of reliable data on the surgical burden of disease in conflict settings. No large population-based surveys have been published, and the few programme data that exist tend to reflect availability of services rather than population needs. Without reliable survey data, we cannot know whether an increased caseload reflects an increased disease burden related to the conflict (more road-traffic accidents as people flee conflict) or an underlying need that can no longer be met due to destruction of and limited access to health services.

The bias towards violence-related surgery is reflected in the research field, which has largely focused on the specialised surgical care of trauma.[8] In view of the dire shortage of surgeons in resource-limited settings, more emphasis should be placed on operational research to support the provision of essential surgical care by general doctors or non-physician clinicians, particularly because most essential surgical procedures required in conflict-affected zones are relatively simple interventions.[9]

Whereas the emergency public health response to infectious diseases and malnutrition during conflict is well developed,[7] humanitarian practice-guidelines take a narrow view of surgical needs. The Sphere Project, an interagency effort dedicated to establishing minimum standards of humanitarian assistance for disaster response, limits its guidance for surgical programming to trauma and obstetric care.[10] These guidelines are under review, which presents an opportunity to more comprehensively address surgical needs in conflict and postconflict settings.

Services to support general surgery in conflict settings are lacking mainly because most conflicts occur in least-developed countries where surgical capacity is severely limited: the poorest third of countries benefit from only 3·5% of global surgical interventions.[11] With a growing appreciation of the substantial burden of surgical diseases across the developing world,[12] the relevance of the traditional models of surgical assistance for civilians in conflict merits reconsideration.

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Ticagrelor in ACS: redefining a new standard of care?

Tremendous progress has been achieved over the past decade in the treatment of acute coronary syndromes (ST-segment elevation myocardial infarction [STEMI], non-STEMI [NSTEMI], and unstable angina). In STEMI, primary percutaneous coronary intervention compared with fibrinolytic therapy reduces mortality, reinfarction, stroke, infarct size, and recurrent ischaemia.[1] In moderate-risk and high-risk patients with NSTEMI, early angiography followed by revascularisation with either percutaneous coronary intervention or coronary artery bypass graft surgery compared with a more conservative approach reduces the rates of death or myocardial infarction, recurrent ischaemia, and rehospitalisation.[2,3] Drug-eluting stents have been shown to be safe in acute coronary syndromes, and, compared with bare-metal stents, reduce clinical and angiographic restenosis,[4] further improving quality of life. With expeditious revascularisation recognised as the cornerstone of the treatment of acute coronary syndromes, selecting the optimum pharmacotherapeutic regimen to support the invasive approach becomes imperative. Because platelet activation is intense in acute coronary syndromes, percutaneous coronary intervention, and coronary artery bypass graft surgery, it is not surprising that the thienopyridine clopidogrel, which inhibits ADP-induced platelet activation, when added to aspirin further suppresses ischaemic complications in acute coronary syndromes.[5,6] Prasugrel, which is more potent and rapid-acting than clopidogrel, is even better at preventing myocardial infarction and stent thrombosis in patients with an acute coronary syndrome undergoing percutaneous coronary intervention.[7] However, proportional to their potency, these oral agents increase haemorrhagic complications, the occurrence of which has been strongly linked to subsequent mortality.[8,9] As a result, neither thienopyridine has been shown to improve survival in acute coronary syndromes.

Enter ticagrelor, an oral non-thienopyridine cyclo-pentyl-triazolo-pyrimidine ADP-receptor (P2Y12 antagonist, which like prasugrel is more potent and rapid-acting than clopidogrel. In the PLATO trial, this agent was compared with clopidogrel in more than 18 500 patients with acute coronary syndromes.[10] In *The Lancet*, today, the PLATO investigators[11] now report the detailed outcomes in around 13 000 patients (72·0% of all those enrolled) managed with an urgent early invasive approach. Like prasugrel, ticagrelor compared with clopidogrel significantly reduced rates of myocardial infarction and stent thrombosis, accompanied by an increase in major bleeding that was unrelated to coronary artery bypass graft surgery. However, that is where the comparison ends. In TRITON, prasugrel increased bleeding that was related to coronary artery bypass graft surgery, all-cause bleeding, and transfusions, as well as life-threatening and fatal bleeding which largely offset its expected benefits from prevention of myocardial infarction and stent thrombosis. As a result, total mortality at 15 months was not significantly different with prasugrel and clopidogrel