

# **Tranexamic acid and surgical bleeding**

# Surgical bleeding

- 230 million people undergo major surgery every year
- Bleeding is a common complication
- Many surgical patients receive a blood transfusion
- But blood for transfusion is scarce, expensive and transfusion is not without risk

# Tranexamic acid in surgery

- TXA safely reduces death in bleeding trauma patients
- TXA has been used for many years in some surgeries
- However, effects of TXA for surgical bleeding are uncertain
- Concerns about safety of TXA limit its routine use

# Effects of TXA in surgical patients – a systematic review

- Randomised controlled trials
- Patients of any age undergoing elective or emergency surgery
- TXA compared to placebo or no TXA control group
- Blood transfusion, blood loss, thromboembolic events, death

- References

*Ker K, Edwards P, Perel P, Shakur H, Roberts I. Effect of tranexamic acid on surgical bleeding: systematic review and cumulative meta-analysis. BMJ 2012;344:e3054.*

*Ker K, Prieto-Merino D, Roberts I. Systematic review, meta-analysis and meta-regression of the effect of tranexamic acid on surgical blood loss. British Journal of Surgery 2013; 100(10):1271-9.*

# Description of trials

- 129 trials
- Published between 1972 and 2011
- 10,488 patients
- Cardiac, orthopaedic, head & neck, ENT, gynaecologic, hepatic, urologic, vascular surgery

## Results of meta-analyses of effect of TXA on blood transfusion, blood loss, thromboembolic events and death

<b>Outcome</b>	<b># trials</b>	<b>Risk ratio</b>	<b>P value</b>
Blood transfusion	95	0.62 (0.58-0.65)	<0.001
Blood loss	104	0.63 (0.62-0.64)	<0.001
Myocardial infarction	73	0.68 (0.42-1.09)	0.11
Stroke	71	1.14 (0.65-2.00)	0.65
Deep vein thrombosis	72	0.86 (0.53-1.39)	0.54
Pulmonary embolism	66	0.61 (0.25-1.47)	0.27
Death	72	0.61 (0.38-0.98)	0.04

# Results of meta-analyses of effect of TXA on blood transfusion by type of surgery

<b>Outcome</b>	<b># trials</b>	<b>Risk ratio</b>	<b>P value</b>
Cardiac	42	0.65 (0.60-0.70)	<0.001
Orthopaedic	36	0.55 (0.49-0.61)	<0.001
Hepatic	2	0.52 (0.39-0.68)	<0.001
Urological	2	0.66 (0.48-0.91)	0.01
Vascular	1	0.58 (0.34-0.99)	0.05
Obs & gynae	5	0.86 (0.48-1.54)	0.61
Cranial	7	0.63 (0.45-0.86)	0.004

## Further results

- The effect of TXA on blood loss and transfusion remained large and highly statistically significant even when analysis was restricted to trials with adequate allocation concealment
- Results from a meta-regression suggested that the effect of TXA on blood loss did not vary over the dose range assessed (5.5 to 300 mg/kg)
- 1 in 4 trials did not report data on thromboembolic events



# Summary

- TXA reduces blood transfusion and blood loss by about a third
- A total dose of 1 g is likely to be sufficient for most adults
- Effect on death and thromboembolic events is uncertain
- Weigh up potential risks and benefits before use