

#### 4.1.d Composition of Enteral Nutrition: Immune Enhancing Diets: Ornithine Ketoglutarate (OKG)

*There were no new randomized controlled trials since the 2015 update and hence there are no changes to the following summary of evidence.*

**Question:** Does supplementation of enteral nutrition with ornithine ketoglutarate (OKG) result in better outcomes in the critically ill adult patient?

**Summary of evidence:** There were three level 2 studies that compared OKG supplementation to placebo in burn patients.

**Mortality:** All three studies reported on mortality and found no differences between the groups (RR 0.92, 95% CI 0.39, 2.19, p=0.9; figure 1).

**Infections:** Not reported.

**LOS:** Not reported.

**Other complications:** Wound healing times were significantly shorter (Coudray-Lucas p<0.05) and wound healing scores were significantly higher (Donati) in the groups receiving OKG. Improved nutritional indices were seen in the groups receiving OKG in all three studies [a higher increase in serum transthyretin levels from day 4-21 (Coudray-Lucas) and improved nitrogen balance, serum transthyretin and retinol binding protein was also observed in the groups receiving OKG (Donati, DeBandt)].

#### **Conclusions:**

- 1) EN supplementation of OKG has no effect on mortality in critically ill burn patients.
- 2) EN supplementation of OKG may be associated with improved nutritional indices and may be associated with improved wound healing in burn patients.

*Level 1 study: if all of the following are fulfilled: concealed randomization, blinded outcome adjudication and an intention to treat analysis.*

*Level 2 study: if any one of the above characteristics are unfulfilled*

**Table 1. Randomized Studies Evaluating Supplementation Of Enteral Nutrition With OKG In Critically ill Patients**

Study	Population	Methods (score)	Intervention	Mortality # (%)		RR (CI)**	Infections # (%)	
				Experimental	Control		Experimental	Control
1) De Bandt 1998	Severe Burns ≥ 20 % - 50 % TSBA N = 54	C.Random: not sure ITT: no Blinding: no (5)	OKG 10, 20, 30 gms bolus and continuous vs. soy protein 10, 20, 30 gms*  Isonitrogenous, isocaloric	5/32 (16)	2/16 (13)	1.25 (0.27,5.75)	NR	NR
2) Donati 1999	Severe Burns 20-60 % TSBA N = 60	C.Random: not sure ITT: yes Blinding: double (8)	OKG 10 gms BID via boluses for 21 days vs. placebo ( 20 gm maltodextrine)  Non-isonitrogenous ,isocaloric	0/31 (0)	0/29 (0)	0.94 (0.02,45.8)	NR	NR
3) Coudray-Lucas 2000	Severe burns ≥ 25 % TSBA N= 49	C.Random: yes ITT: yes*** Blinding: double (8)	OKG 10 gms BID via enteral route vs. Soy protein mixture 10 gms BID for 3 weeks  Isonitrogenous, isocaloric	5/25 (20)	6/24 (25)	0.08 (0.28, 2.28)	NR	NR

C.Random: Concealed randomization

ITT: Intent to treat

NR: Not reported

TSBA: total surface burn area

\* De Bandt et al: data from the combined OKG group (i.e. continuous and bolus and all doses) is compared to the combined control group.

\*\* RR= Relative risk, CI= Confidence intervals

Figure 1. Mortality

Comparison: 01 OKG vs. Placebo  
Outcome: 01 Mortality

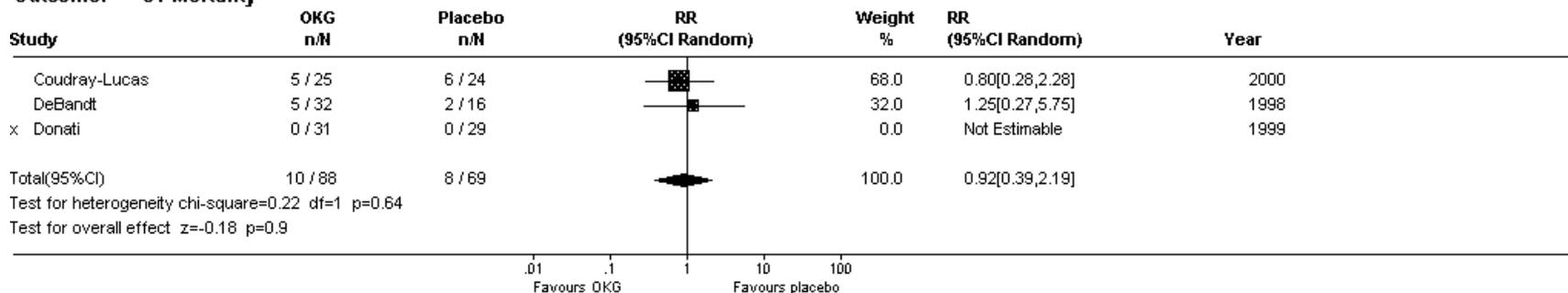


Table 2. Excluded Articles

#	Reason excluded	Reference
1	Elective surgery pts	Hammarqvist F, Wernerman J, von der Decken A, Vinnars E. Alpha-ketoglutarate preserves protein synthesis and free glutamine in skeletal muscle after surgery. <i>Surgery</i> 1991;109:28-36.
2	No clinical outcomes	Le Bricon T, Coudray-Lucas C, Lioret N, Lim SK, Plassart F, Schlegel L, De Bandt JP, Saizy R, Giboudeau J, Cynober L. Ornithine alpha-ketoglutarate metabolism after enteral administration in burn patients: bolus compared with continuous infusion. <i>Am J Clin Nutr.</i> 1997 Feb; 65(2): 512-8.