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 transthreytin 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.

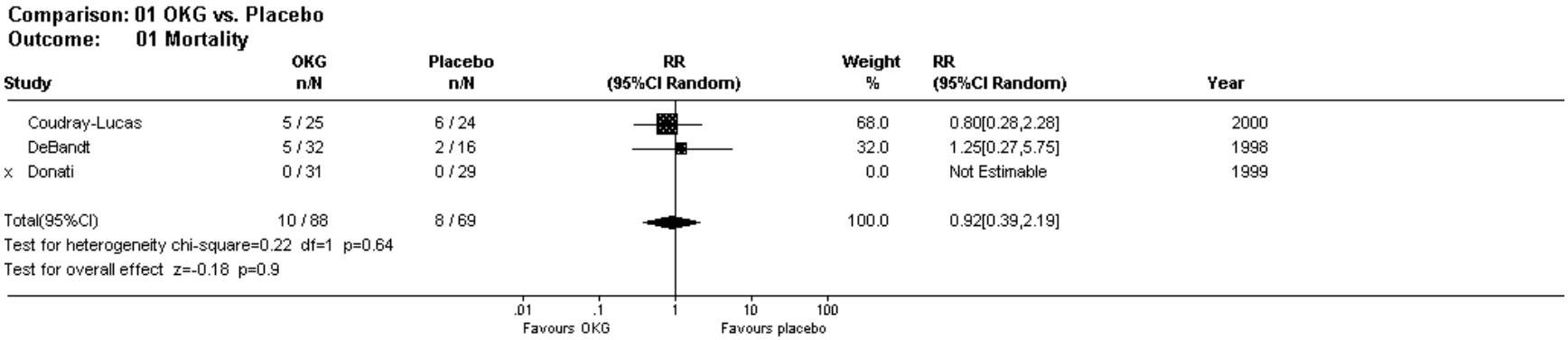
Level 1 study: *if all of the following are fulfilled: concealed randomization, blinded outcome adjudication and an intention to treat analysis.*
Level 2 study*: If any one of the above characteristics are unfulfilled*

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

Study	Population	Methods (score)	Intervention	Mortality # (%) Experimental	Mortality # (%) Control	RR (CI)**	Infections # (%) Experimental	Infections # (%) 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, isocaolric	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



References

Included Articles

1. De Bandt JP, Coudray-Lucas C, Lioret N, Lim SK, Saizy R, Giboudeau J, Cynober L. A randomized controlled trial of the influence of the mode of enteral ornithine alpha-ketoglutarate administration in burn patients. J Nutr. 1998 Mar; 128(3): 563-9.
2. Donati L, Ziegler F, Pongelli G, Signorini MS. Nutritional and clinical efficacy of ornithine alpha-ketoglutarate in severe burn patients.Clin Nutr. 1999 Oct; 18(5): 307-11.
3. Coudray-Lucas C, Le Bever H, Cynober L, De Bandt JP, Carsin H. Ornithine alpha-ketoglutarate improves wound healing in severe burn patients: a prospective randomized double-blind trial versus isonitrogenous controls.Crit Care Med. 2000 Jun; 28(6): 1772-6.

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. Surgery 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. Am J Clin Nutr. 1997 Feb; 65(2): 512-8.