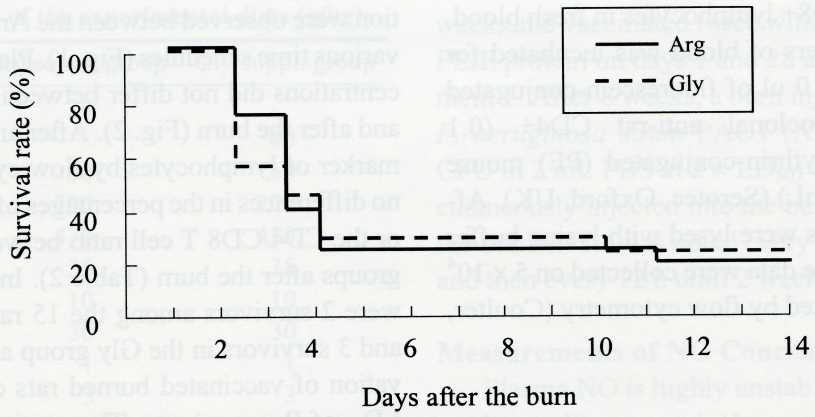

Fig. 3. Effect of Arg or Gly supplement on the survival of vaccinated burned rats challenged with 2 × LD_{50} of *Pseudomonas aeruginosa*. No significant difference was observed between the 2 groups.

seen by Barbul et al.[25] with Arg supplementation. Saito et al.[20] also confirmed this observation by demonstrating that dietary supplementation of Arg had a dose-response effect on a delayed hypersensitivity test. In this study, we used Gly as a control to investigate the effect of Arg supplementation on humoral immunity, and whether Arg together with PEIF vaccination may have synergistic protective effects in burned rats with *P. aeruginosa* infection.

Gly is an abundant nonessential amino acid in the plasma and tissue pools. Recent in vitro studies have shown that Gly activates a glycine-gated chloride channel which may prevent increases in calcium concentrations in lymphocytes and inhibits cell proliferation.[26,27] In this study, we added Gly to the control group to keep the 2 groups isonitrogenous as described in the study carried out by Leon et al.[28] because a previous study demonstrated that Gly had no intrinsic beneficial or adverse effects on immune function.[29] In addition, glycyl-glutamine dipeptide was also used in total parenteral nutrition studies concerned with immunity of the small intestine and respiratory tract.[30,31]

In this study, 2.3% of total energy was supplied by Arg; this amount of Arg was found to reduce mortality in burned guinea pigs.[20] Additionally, a shortened hospital stay and reduced wound infection were observed in burn patients consuming this level of Arg when compared to those using other enteral formulations.[32] In contrast with these studies, the survival rate of vaccinated burn rats in this study did not differ after challenge with *P. aeruginosa*. This result, however, is similar to the report carried out by Gonce et al.[33] who observed that Arg supplementation of 2% and 4% did not improve survival, as compared to no supplementation in guinea pigs with established peritonitis. Since the species and disease model differ from this study, the results of other studies may not apply to the present experimental situation.

In order to further understand the effect of Arg supplementation on the immune response after the burn, plasma NO concentrations and selected immunologic parameters were studied. Arg is the sole precursor of NO in most mammalian cells. The L-Arg-NO pathway has been proposed to be the primary defense mechanism for killing intracellular organisms and to be the main mechanism of macrophage toxicity for target cells.[34] In this study, plasma NO_2^-/NO_3^- concentrations were analyzed, and we observed no significant difference in plasma NO_2^-/NO_3^- concentrations between the 2 groups after the burn. This result agrees with that of a study by Cui et al.,[12] in which they also found no difference in plasma NO products between an Arg-supplemented group and a control group after burn injury. It is possible that NO synthesis in response to thermal trauma and exogenous Arg administration were already at a peak. Cui et al.[12] found that NO production increased in the supernatant of cultured splenic lymphocytes in the Arg group. Since we did not analyze NO levels in cul-