Isolation, density purification, and invitro culture maintenance of functional caprine islets of Langerhans as an alternative islet source for diabetes study.

ABSTRACT

Background : Insufficient availability of human donors makes the search for alternative source of islet cells mandatory for future developments in pancreatic transplantation. The present study investigates the potential of caprine as an alternative source of pancreatic islets. The objectives of the study were to optimize techniques for caprine islet isolation and purification for culture establishment, and to subsequently assess their viable and functional potential. Methods: Caprine pancreatic tissues were collected from a local slaughterhouse and prior transported to the laboratory by maintaining the cold chain. Islets were obtained by a collagenase-based digestion and optimized isolation technique. Islet cell purity and viability were determined by dithizone and trypan blue staining, respectively. Islet clusters of different sizes were positively identified by staining methods and demonstrated 90% viability in the culture system. Following static incubation, an in vitro insulin secretion assay was carried out and analyzed by ELISA. Results: The islets remained satisfactorily viable for 5 days in the culture system following regular media changes. The current study has successfully optimized the isolation, purification and culture maintenance of caprine islets. Conclusion: The successful yield, viability and functionality of islets isolated from the optimized protocol provide promising potential as an alternative source of islets for diabetes and transplantation researches.

Keyword: Caprine islets; Insulin; Isolation; Pancreas; Purification.