

unruptured tubal ectopic pregnancy ($P < 0.0001$).

It is possible therefore that increased levels of creatine kinase associated with muscular damage may precede rupture of the tube. The positive correlation between gestational age and creatine kinase levels in ruptured tubal ectopic pregnancy is some evidence for this proposition as it shows that the increase in creatine kinase levels, and in the extent of tubal muscular damage that it marks, is a function of time, and not simply an end result of the eventual disruption of the tubal wall.

All the women, with ruptured tubal pregnancy had significant tubal damage and raised values of CK. These indicate that tubal rupture is associated with an increase in creatine kinase levels. These results are in agreement with Singh *et al* ⁽⁸⁾ in their study suggested that maternal CK levels are significantly higher in women with tubal pregnancy and are reliable in the diagnosis of a tubal pregnancy.

Because the differential expression of CK-MB isoenzymes varies significantly between different tissues ^(5,6), then it might be useful to estimate CK-MB levels separately. Notably, no previous studies on CK-MB fractions in tubal EP were found in the literature. Intriguingly, in present study women with EP were significantly higher CK-MB levels compared with the intrauterine abortion ($P < 0.001$) and normal intrauterine pregnancy ($P < 0.0001$).

Estimation of CK-MB with a cut-off value of 4.55 IU/L produces a good sensitivity 81.64%, specificity 84.3 % and 80.9 % efficiency, the positive predictive value was 88.5 % and the negative predictive value 71.4 % in diagnosis of tubal ectopic pregnancy.

Conclusively, the current study is the first to demonstrate that women with EP have a significantly higher of CK-MB levels compared with women with IU normal or abortive pregnancy. The exact reasons for the increase CK-MB relative level in tubal EP are at present unknown and remain to be elucidated.

References

1. Barnhart KT. Clinical practice. Ectopic pregnancy. N Engl J Med. 2009; 361: 379-87.
2. Kirk E, Papageorgiou AT, Condous G, et al. The diagnostic effectiveness of an initial transvaginal scans in detecting ectopic pregnancy. Hum Reprod. 2007; 22: 2824-8.
3. Bangsgaard N, Lund CO, Ottesen B, et al. Improved fertility following conservative surgical treatment of ectopic pregnancy. BJOG. 2003; 110: 765-70.
4. Seror V, Gelfucci F, Gerbaud L, et al. Care pathways for ectopic pregnancy: a population-based cost-effectiveness analysis. Fertil Steril. 2007; 87: 737-48.
5. Lott JA, Abbott LB. Creatine kinase isoenzymes. Clin Lab Med. 1986; 6: 547-76.
6. Malasky BR, Alpert JS. Diagnosis of myocardial injury by biochemical markers: problems and promises. Cardiol Rev. 2002; 10: 306-17.
7. Mongiardo A, Ferraro A, Ceravolo R, et al. Mechanism of troponin and CK-MB release after percutaneous coronary interventions. Ital Heart J. 2002; 3: 270-4.
8. Singh A, Bansal S. Serum Creatinine kinase - an alternative diagnostic marker in ruptured tubal pregnancy. J Obstet Gynecol India. 2005; 55(5): 448-50.
9. Lavie O, Beller U, Neuman M, et al. Maternal serum creatinine kinase: a possible predictor of tubal pregnancy. Am J Obstet Gynecol. 1993; 169:1149-50.
10. Chandra L, Jain A. Maternal serum creatine kinase as a biochemical marker of tubal pregnancy. Int J Gynecol Obstet. 1995; 49: 21-3.
11. Saha PK, Gupta I, Ganguly NK. Evaluation of serum creatine kinase as a diagnostic marker for tubal pregnancy. Aust NZJ Obstet Gynecol 1999; 39: 366-7.
12. Birkhahn RH, Gaeta TJ, Leo PJ, et al. The utility of maternal creatine kinase in the evaluation of ectopic pregnancy. Am J Emerg Med 2000; 18:695-7.
13. Kurzel RB, Mazdisnian F, Paige S, et al. Serum creatine kinase is not a reliable indicator of ectopic pregnancy. Int J Fertil Women's Med 2001; 46:300-3.
14. Qasim SM, Trias A, Sachdev R, et al. Evaluation of serum creatine kinase levels in ectopic pregnancy. Fertil Steril. 1996; 65: 443-5.
15. Korhonen J, Alfthan H, Stenman, U et al. Failure of creatine kinase to predict ectopic pregnancy. Fertil Steril. 1996; 65: 922-4.
16. Darai E, Vlastos G, Benifla J, et al. Is maternal serum creatine kinase actually a marker for early diagnosis of ectopic pregnancy? Eur J Obstet Gynecol Reprod Biol. 1996; 68: 25-7
17. Vitoratos N, Gregariou O, Papadiaz C, et al. Clinical value of creatinine kinase in diagnosis of ectopic pregnancy. Gynecol Obstet Invest. 1998; 46: 80-3.
18. Costa TN, Cassaro Stunz CM, Nicolau JM, et al. Comparison of MB fraction of creatine kinase mass and troponin I serum levels with necropsy findings in acute myocardial infarction. Am J Cardiol. 2008; 101 311-4.
19. Develioglu OH, Askalli C, Uncu G, et al. Evaluation of serum creatine kinase in ectopic pregnancy with reference to tubal status and histopathology. BJOG 2002; 109(2): 121-8.

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