

Torsade de Pointes due to vitamin D deficiency-related hypomagnesemia

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Background: Hypomagnesemia is predisposed to prolonged QTc interval. Torsade de Pointes(TdP) is a rare and critical cardiac arrhythmia, that is associated with prolonged QTc interval. We encountered a case of TdP and cardiac arrest associated with severe vitamin D deficiency(VDD). We report this case because VDD-related TdP is extremely rare.

Case: A 56-year-old male was hospitalized for dyspnea. His medical history included hypertension, diabetes, liver cirrhosis, heart failure, asthma, and COPD. On hospital day(HD) 2 TdP and cardiac arrest happened, followed by successful resuscitation. Then TdP recurred on HD 5, and rhythm was normalized after DC cardioversion. Before the onset of TdP, there were definite hypomagnesemia, hypophosphatemia, and VDD. Serum calcium and potassium levels were in the normal range. Only magnesium supplementation via IV and PO did not correct serum magnesium level. However, after additional vitamin D, calcium, and phosphate supplementation with magnesium, serum magnesium level was recovered within normal range and QTc prolongation has improved. No additional dysrhythmia occurred while receiving maintenance vitamin D supplementation.

Discussion: Severe VDD is very common in elderly patients. However, it can lead to a severe electrolyte imbalance that can cause fatal arrhythmia such as Torsade de Pointes. Therefore, clinicians should consider screening for VDD in the elderly.

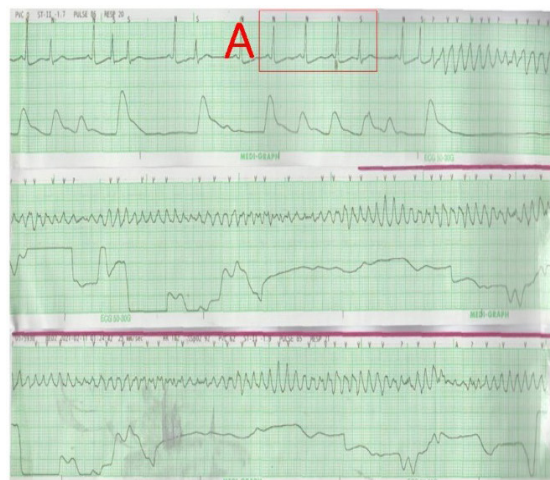


Figure 1. EKG strip at the time that TdP occurred. In Box A, QTc interval=604ms[by Bazett formula], QT interval=480ms, RR interval=626ms.

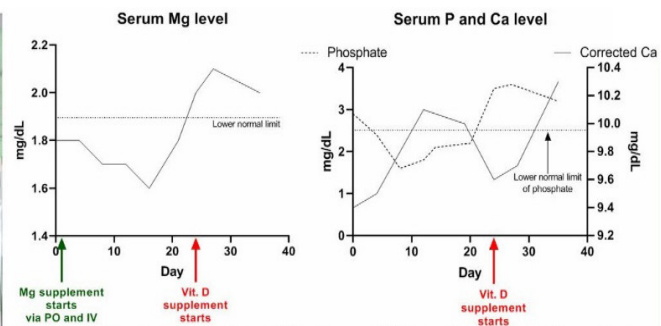


Figure 2. Serum electrolytes(Mg, Ca and P) level follow-up from the day that TdP happened (Day 0).



Figure 3. EKG strip with normalized QTc interval of 434ms after vitamin D supplement.