

A Survival Prediction Algorithm for Covid-19 Patients Admitted to a District General Hospital

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August 13, 2020

Abstract

OBJECTIVE: To collect and review data from consecutive patients admitted to Queen’s Hospital, Burton on Trent for treatment of Covid-19 infection, with the aim of developing a predictive algorithm that can help identify those patients likely to survive. **DESIGN:** Consecutive patient data was collected from all admissions to hospital for treatment of Covid-19. Data was manually extracted from the electronic patient record for statistical analysis. **RESULTS:** Data, including outcome data (discharged alive / died) was extracted for 487 consecutive patients, admitted for treatment. Overall, patients who died were older, had very significantly lower Oxygen saturation (SpO2) on admission, and higher CRP as evidenced by a Bonferroni-corrected $P < 0.0056$). Evaluated individually, platelets and lymphocyte count were not statistically significant but when used in a logistic regression to develop a predictive score, platelet count did add predictive value. The prediction algorithm we developed was: $P(\text{survival}) = \frac{1}{1 + e^{-1(-16.7104 - 3.3810 \text{LN}(\text{age}) + 6.5592 \text{LN}(\text{SpO}_2) - 0.4584 \text{LN}(\text{CRP}) + 0.7183 \text{LN}(\text{Plt}))}}$ **CONCLUSION:** Age, SpO2 on Admission, CRP and platelets were an effective marker combination that helped identify patients who would be likely to survive. The AUC under the ROC Plot was 0.737 (95% Conf. Interval 0.689-0.784; $P < 0.001$). Further research adding extra markers, is underway.

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