Predicting Educational Performance in Cardiology Fellowship

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Abstract – Part 1

Background: Data at earlier stages in medical training have can predict subsequent performance later in training. Additionally, in residency training, educational conference attendance has been associated with acquisition of medical knowledge. However, limited data exist on the ability of educational metrics to predict outcomes in cardiology fellowships. The unique technical and cognitive skills necessary in cardiology training make identifying variables that predict performance important for learners, admission committees, program directors, and ultimately, patients.

Objective: This study sought to identify associations between United States Medical Licensing Exam (USMLE) scores, American College of Cardiology In-Training Exam (ACC-ITE) scores, educational conference attendance, and clinical evaluations during fellowship.

Methods: The study population included 39 trainees who began our cardiology fellowship between 2007 and 2010. Two trainees were excluded; one left the fellowship early and the other transferred from another fellowship. We collected USMLE scores, ACC-ITE scores, educational conference attendance, and global evaluation scores (5-point Likert scale with a high of 5) during the clinical years of fellowship. Associations were assessed with correlation coefficients and linear regression.

Abstract – Part 2

Results: The final study group included 37 fellows. Mean ($\pm$SD) clinical evaluation score was 4.08 ± 0.16, mean in-training score was 68 ± 25 percentile, and mean USMLE score was 231 ± 19. Fellows attended 173 ± 48 conferences during their clinical training. Average USMLE scores (R=0.39; p=0.02) were significantly associated with evaluation scores (Figure 1). The association was strongest (R=0.40; p=0.01) for USMLE Step 1. USMLE scores trended toward a significant association with ACC-ITE scores (R=0.65; p=0.09; Figure 2). This association was strongest for USMLE Step 3 (R=0.78; p=0.04). Educational conference attendance in the first two years of fellowship was not associated with overall evaluation scores (R=0.08; p=0.63) but was significantly associated with ACC-ITE scores (R=0.46; p=0.008; Figure 3). No significant associated existed between evaluations and ACC-ITE scores (R=0.34; p=0.19).

Significance: In a 4-year cohort of cardiology fellows, USMLE scores were associated with overall performance, and conference attendance predicted in-training exam scores. These findings suggest that USMLE scores can be a helpful component of the prospective fellow's application packet. Additionally, programs should encourage conference attendance during fellowship to augment medical knowledge.

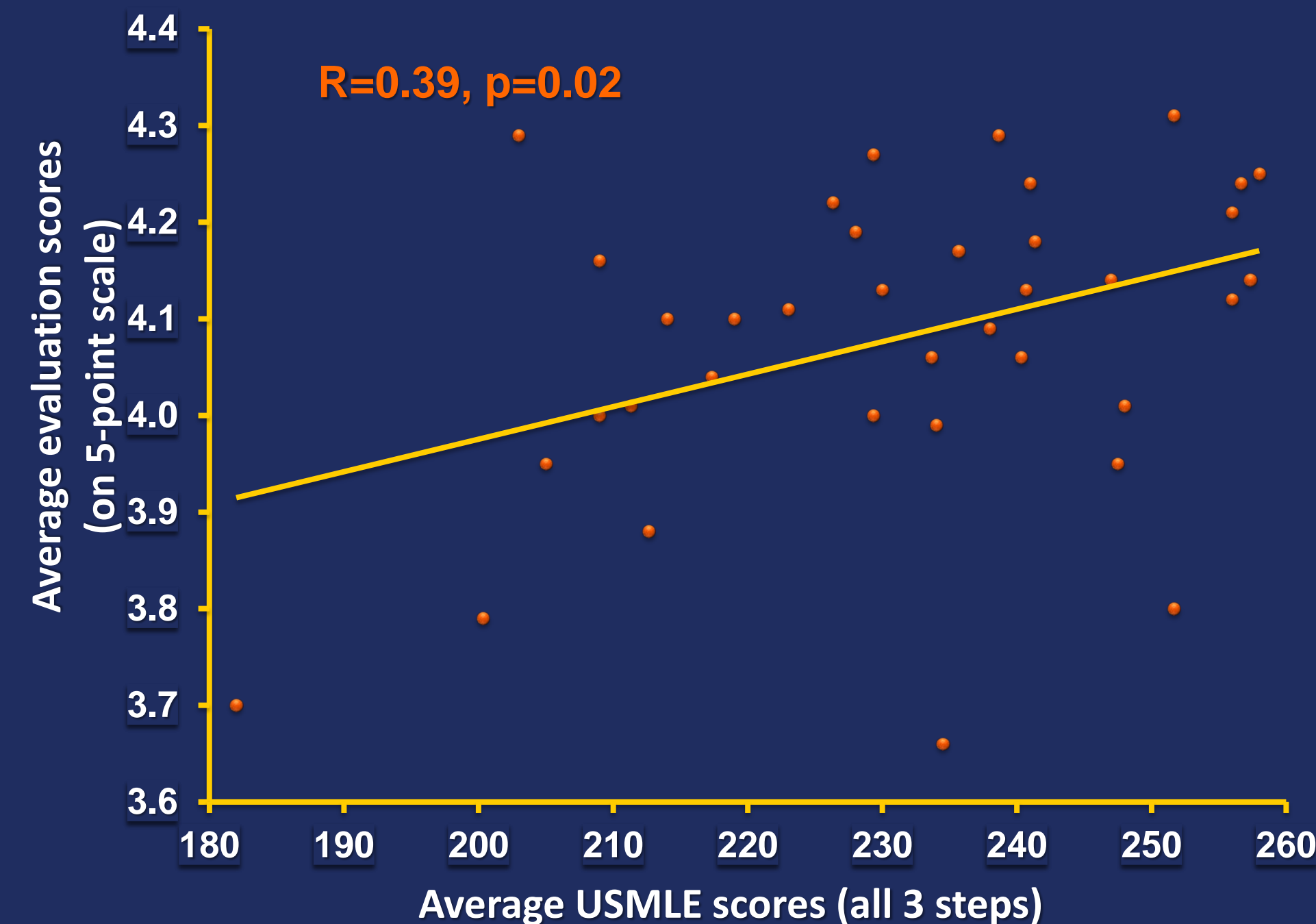### Figure 1 – Clinical evaluations vs. USMLE scores

R=0.39, p=0.02

X-axis: Average USMLE scores (all 3 steps)
Y-axis: Average evaluation scores (on 5-point scale)

Figure 2 – In-training exam vs. USMLE scores

R=0.65, p=0.09

X-axis: Average USMLE scores (all 3 steps)
Y-axis: Average ITE score (percentile)
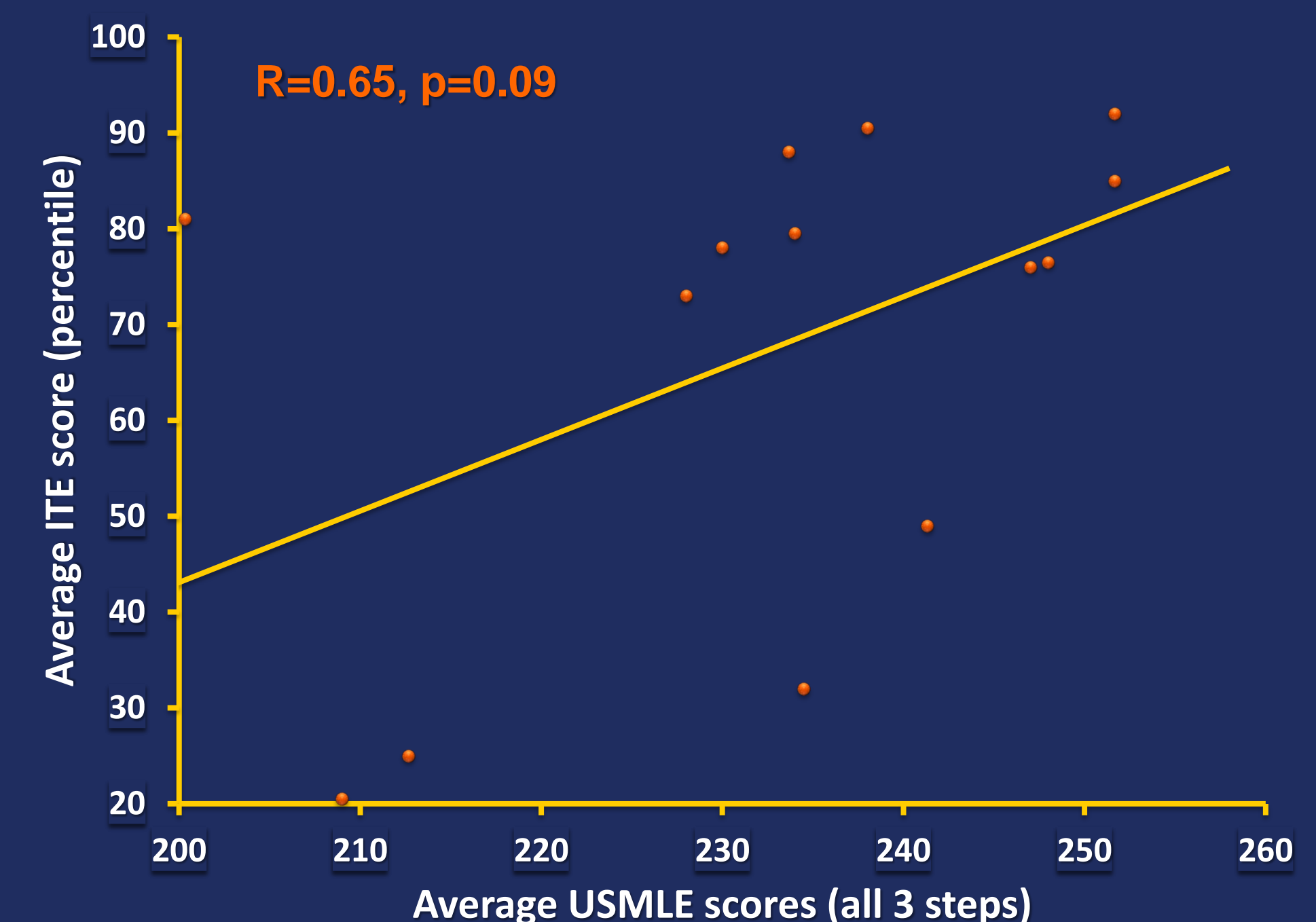
Figure 3 – In-training exam scores vs. educational conference attendance

R=0.46, p=0.008

X-axis: Educational conference attendance
Y-axis: Average ITE score (percentile)
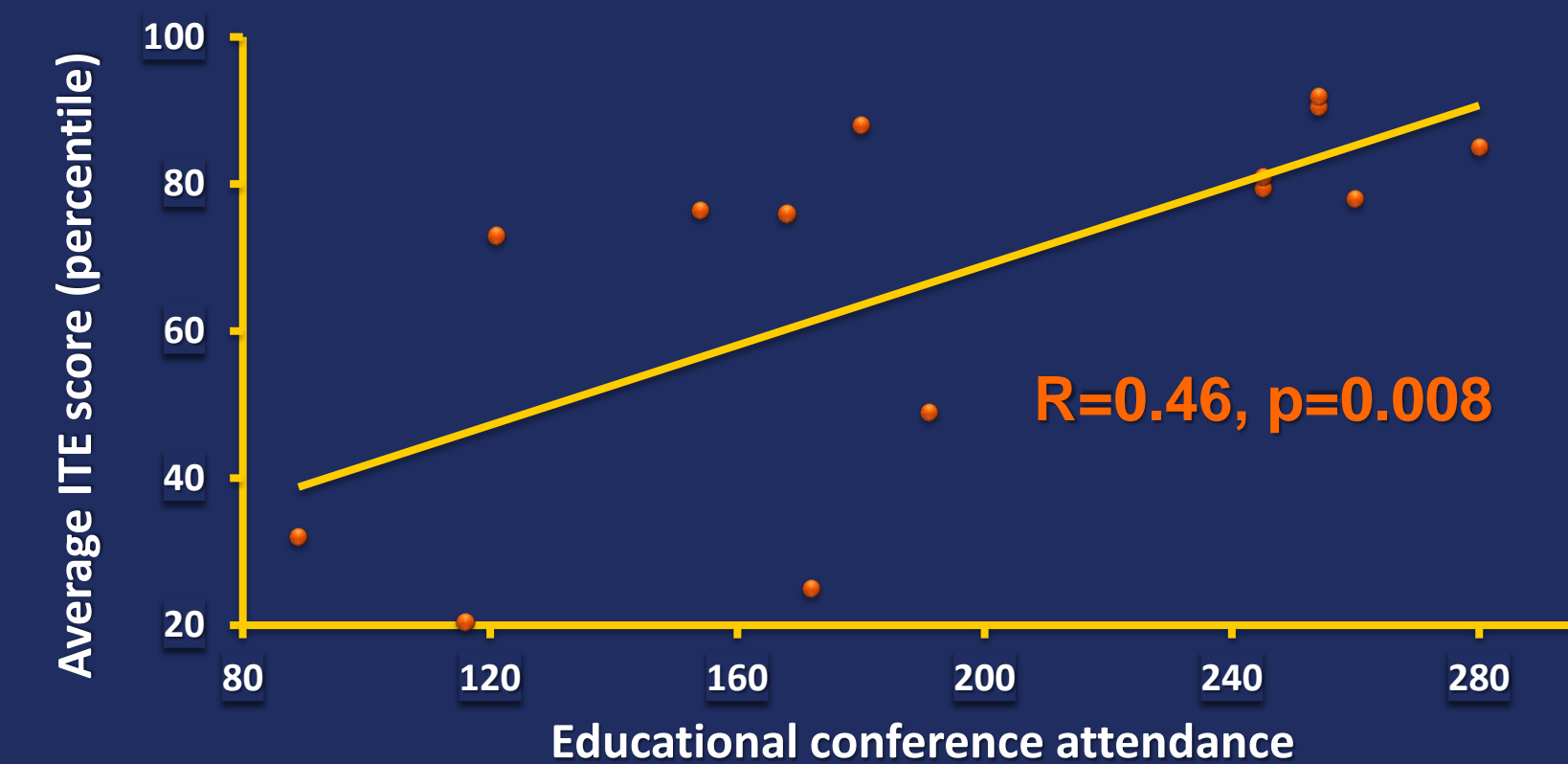
Conclusions

- USMLE scores can predict clinical performance during training and performance on the ACC's in-training exam.
- Attendance at educational conferences is also associated with performance on the ACC's in-training exam.
- Cardiology fellowship program leaders should include USMLE scores in their global assessments of applicants for cardiology fellowships.
- Cardiology fellowship program leaders should also encourage attendance at educational conferences to improve knowledge acquisition during training.