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CASE PRESENTATION

A 72-year-old male with a history of diabetes complicated by foot ulcers, peripheral/coronary artery disease, and hypertension presented to the hospital due to osteomyelitis of bilateral feet. He underwent an open left 3rd toe amputation with surgical debridement and right 3rd and 4th trans-metatarsal amputation. After subsequent right lower extremity (RLE) diagnostic angiogram where the wire could not pass through the anterior nor posterior tibial artery, as well as distally in retrograde angiogram, he underwent a right below knee amputation (BKA). Post-operatively, his pain was managed with a morphine patient-controlled analgesia (PCA) pump receiving about 30mg of morphine in eight to ten hours. On post-operative day one, acute pain management service (APS) was consulted to evaluate his inadequately managed pain. At time of evaluation, patient was in a state of hyperactive delirium which made assessment of his pain difficult. APS recommended stopping his PCA and consulting geriatrics before re-assessments and further recommendations for management of post-operative pain.

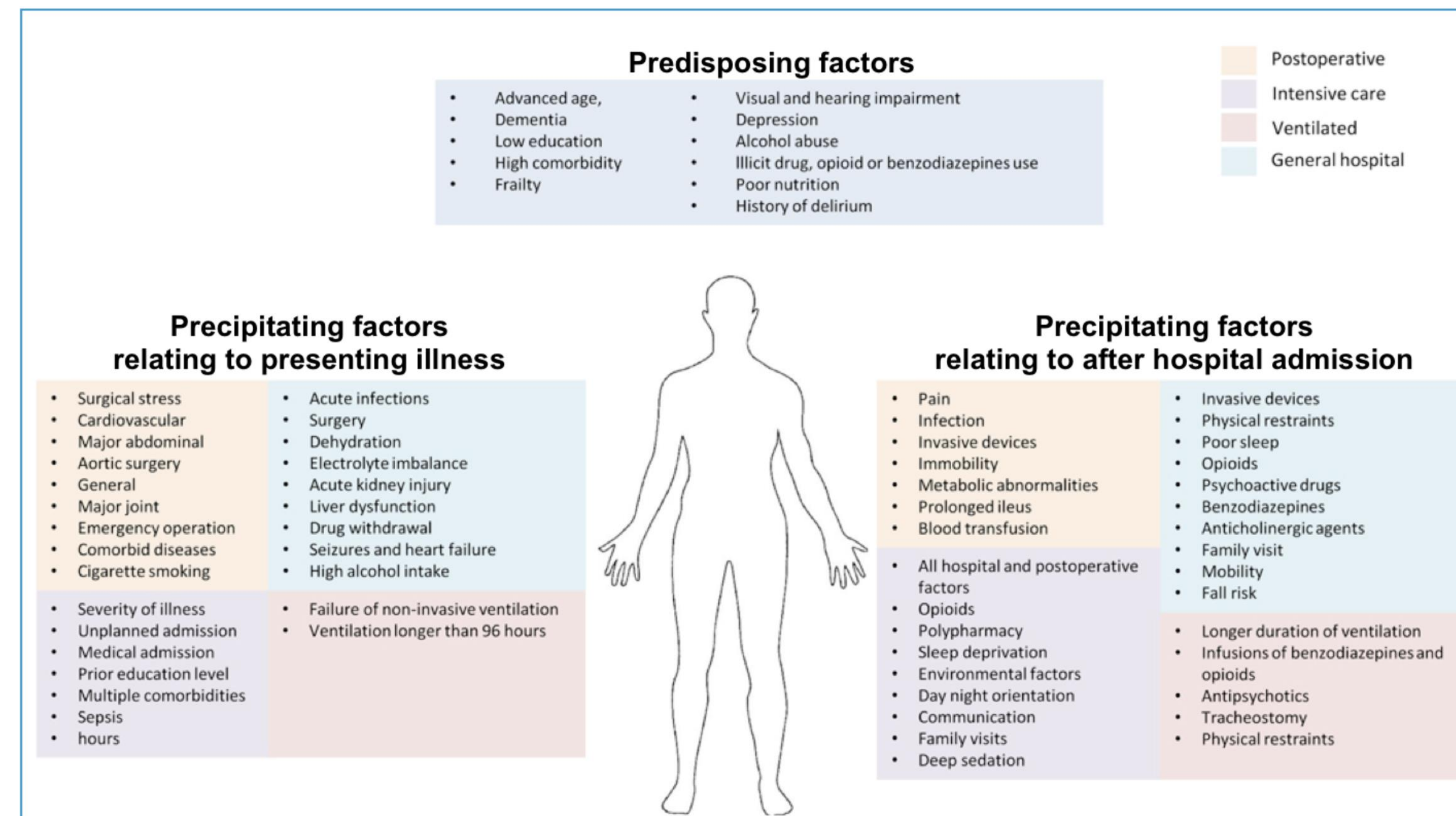
CLINICAL COURSE

• Patient originally admitted to hospital for concern for osteomyelitis of bilateral feet and underwent multiple toe/metatarsal amputations and debridements. He later underwent RLE BKA after angiogram. As patient was elderly, with severe pain expected post-operatively, the primary team started a morphine PCA immediately.

• Patient is post-op from RLE BKA experiencing a high level of pain and in a state of hyperactive delirium. At this time, patient was on a morphine PCA receiving about 30mg of morphine in eight hours. APS was consulted POD1 regarding further management of pain.

• Given patient's delirious state, recommendations were made to remove analgesics, especially PCA, to better assess his pain and attempt to improve his delirium. Additionally, APS recommended geriatrics consult for further management of delirium. Further, risk/benefit analysis was given towards what medications patient was on, such as anticoagulants, which might prevent certain regional options to treat his pain.

• On POD2 the patient received a right popliteal/saphenous multivesicular liposomal bupivacaine single shot injection which resulted in improvement in pain scores and decreased use of analgesics. POD5 patient was found to be in PEA arrest with ROSC achieved, and he later passed away POD5.



Risk factors for delirium. Risk factors for delirium relate to premorbid or predisposing factors (that is, a patient's characteristics) and to precipitating factors, which are factors relating to the presenting illness or that occur after hospital admission. PMID: 33184265

Figure 1: Factors that predispose patients to delirium.

	07/01 - 07/02		07/02 0700 - 07/03 0659						07/03 0700 - 07/04 0659			
4 Hrs: ◀	23-03	03-07	07-11	11-15	15-19	19-23	23-03	03-07	07-11	11-15	15-19	▶
▼ Pain Site #1												
Pain Score	10*	0*	10*	10	10*		7*	8*		7*	6*	Pain Score
Pain Goal	No pain											Pain Goal
▼ Analgesics												
Acetaminophen IV (mg)	1,000		1,000		1,000		1,000			1,000	1,000	Acetaminophe...
Aspirin (mg)				25	25		50*	50*		81		Aspirin (mg)
FentaNYL IJ (mcg)										25	25	FentaNYL IJ (...)
morphine (mg)		5*	1									morphine (mg)
Morphine Sulfate IV (mg)			4									Morphine Sulf...
▼ Morphine PCA												
Action	New Bag	Rate/D...	DISCO...*									Action
Continuous Infusion Rate	0 mg/hr	0 mg/hr	0 mg/hr*									Continuous Inf...
PCA Dose	1 mg	1.2 mg	0 mg*									PCA Dose
PCA Lockout	6 Minu...	6 Minu...	0 Minu...									PCA Lockout
Total drug (mg)	50		21.4									Total drug (mg)
Delivered			15									Delivered
Total demand (attempts)	0		54									Total demand (...)
Tubing Prime Waste (mL)	1.1	0	10									Tubing Prime ...
Volume at Handoff or D/C (mL)			21*									Volume at Han...
Measured waste	0	0	21									Measured waste

Figure 2: Trend of patient reported pain and analgesia use

DISCUSSION

• **What is delirium?:** Delirium is defined as an acute state of fluctuating awareness and disorientation that can lead to significant changes in a patient's behavior, thinking, and perception. The overall prevalence of delirium in the elderly is 1-2%, but when looking at hospital admissions the incidence is higher, especially post-operatively where it ranges from 15-53% in patients over sixty-five years old. Moreover, in the intensive care unit, incidence of delirium in elderly patients is about 70-87%.

• **Delirium in this case:** In our patient, he was post-operative with the effects of anesthesia, battling infection with multiple co-morbidities, on a morphine PCA, and admitted from a skilled nursing facility, all which increased his risk for delirium.

• **Treatment of pain in setting of delirium:** When pain management was consulted, he was in hyperactive delirium which made assessment of pain difficult. Removing analgesics, decreasing agitating elements, and having geriatrics on board as consult as well to further manage delirium assisted in multi-disciplinary management. With analgesics stopped and geriatrics recommendations for hyperactive delirium, he was able to be more appropriately assessed. A regional trial of multivesicular liposomal bupivacaine was recommended as our patient was complaining of pain in the right leg and providing regional blockade would be a way to truly assess if this was his pain generator. With this trial, neuroleptic agents as well as his pain, two precipitating factors worsening his delirium, could be decreased.

LEARNING POINTS

- Pain and its experience are multifaceted, therefore treatment within different populations is important to understand as a provider, especially with confounding variables such as delirium, hypoactive and hyperactive.
- With multidisciplinary care, adverse outcomes can be avoided, and an optimal treatment plan can be obtained that will aid in increasing the patient's pain control, quality of life, and functional outcomes.