“Under Pressure”
The New Hypertension Guidelines

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Course Description:
This course will provide the latest information on hypertension (HTN) and hypertensive retinopathy (HTR). Emphasis will be newest HTN guidelines.

Goal:
Provide attendees with the new HTN guidelines, use of advance diagnostic modalities and treatment for HTR, and discuss integration of these into clinical practice.

Learning Objectives:
At the conclusion of this course, attendees will be able to:

1) Know the latest data on HTN and the new HTN guidelines.
2) Appreciate the latest technologies in early diagnosis of hypertensive retinopathy- ultra wide-field imaging, multi-modal imaging with SD-OCT and OCT angiography (OCTA).
3) Be able to recognize HTN urgency and emergency (malignant HTN retinopathy)

Abstract
Hypertension is on the rise. With the new guidelines, nearly half of U.S. adults (46%), up from 32%, could be classified with high blood pressure. Detecting early retinal findings can prevent vision loss and, more importantly, disability and premature death from this disease.
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I. **Hypertension** - ("Silent killer") is the most common primary diagnosis.
   - 103 million Americans (1 of every 3 adults)
   - Risk for stroke, myocardial infarction (MI), vascular disease, and chronic kidney disease (CKD)
     - 69% of people who have a first heart attack (MI)
     - 77% of those who have a first stroke
     - 74% of those who have HF have a BP >140/90 mm Hg
   - "Silent killer": mostly an asymptomatic, unless severely elevated, which is associated with headache, shortness of breath, and anxiety
   - Nearly half of people with high blood pressure (47.5 %) do not have it under control.

II. **Paradigm Shift in Diagnosis**: Latest Hypertension Clinical Practice Guidelines (2017 update)
   - Definition- The new guideline lowers the target for blood pressure treatment to 130/80 mmHg
     - Classification:
       - Elevated: Systolic between 120-129 and diastolic less than 80
       - Stage 1: Systolic between 130-139 or diastolic between 80-89
       - Stage 2: Systolic at least 140 or diastolic at least 90 mm Hg
       - Hypertensive crisis: Systolic over 180 and/or diastolic over 120, with patients needing prompt changes in medication if there are no other indications of problems, or immediate hospitalization if there are signs of organ damage.

III. **Hypertensive Retinopathy (HTR)- an important warning sign** (up to 80% of HTN) Case presentations
   - Pathophysiology
     - Retinal blood vessels have distinct features, which differentiate them from other blood vessels
       - The absence of sympathetic nerve supply
       - Autoregulation of blood flow
       - Presence of blood-retinal barrier
     - Persistent increase in BP causes certain changes in vessel wall:
       - Intima layer: Thickening
       - Media layer: Hyperplasia
       - Arteriolar wall: Hyaline degeneration
   - **Early** phase (HTR):
• General and focal arteriolar narrowing
• Arteriolar/venule (AV) crossing changes: Nicking (Gunn’s Sign)
• Venous deflection (Salus ‘sign)
• Banking of vein distal to the crossing site (Bonnet’s sign)
• Changes in the arteriolar light reflex- Arteriolar sheathing (known as “silver” or “copper” wiring)

• Moderate (exudative phase)
  • Disruption of the blood-brain barrier and leakage of blood and plasma into the vessel wall disrupting the autoregulatory mechanisms.
  • Retinal or flame-shaped hemorrhages, cotton wool spots, exudates
  • Follow-up: six- twelve weeks follow-up to assess for regression with the control of blood pressure

• Malignant HTR (Optic Neuropathy) – case presentation
  • A medical emergency
    ▪ Anti-hypertensive agents (IV drip) for and admission to ICU
    ▪ Goal: Lower Diastolic BP to approximately 100-105 over 2-6 hours
    ▪ Maximum initial fall not to exceed 25%
      • More aggressive decrease (abrupt drop in BP) can lead insufficient perfusion pressures and organ damage
    ▪ Ischemic stroke and myocardial ischemia
    ▪ If focal neurological symptoms present, obtain MRI to
      • r/o acute stroke (rapid BP correction contraindicated)
  • The mortality rate is 50% at 2 months and 90% at one year if untreated
  • Anti-VEGF for macula edema
  • Focal intraretinal periafferent transudates (FIPT)- FIPTs are signs of leakage from dilated pre-capillary retinal arterioles. Represents a breakdown in autoregulation

• Paradigm Shift in patient care:
  • Early clinical findings necessitate referral to PCP for HTN management
    • Early HTR- Associated with 2X risk of stroke according to the ARIC study
    • Moderate HTN-2-3X more likely to develop a stroke (ARIC study).
  • HTN Urgency (Severe Hypertension + NO End Organ Damage)- Patients with blood pressure greater than 180/110 require prompt evaluation and management with PCP.
  • HTN Emergency- Malignant HTR Medical Emergency- Call 911
    • Neurological signs (headaches/ TIA or other neurological signs)
    • Visual field testing
• MRI to r/o Hypertensive Encephalopathy

IV. Hypertensive Choroidopathy- Case presentation
• More common in YOUNG patients with acute severe HBP
• Elschnig’s spots- Focal area of RPE atrophy with associated pigmentation
• Siegrist’s line- Linear RPE pigmented changes that develop over sclerotic choroidal arteries

V. Conclusion
• Hypertension is increasing at an alarming rate
• Optometry plays an important role in detecting the disease.
• By detecting the early warning sign of HTR, we can significantly impact not only the patient’s visual and systemic health, but potentially save their lives

References: